
M1525

Medical Panel PC

User's Manual

Version 1.0

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Chapter 1

General Information

Copyright Notice

All Rights Reserved.

The information in this document is subject to change without prior notice in order to improve the reliability, design and function. It does not represent a commitment on the part of the manufacturer.

Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

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About this User's Manual

This user's manual provides general information and installation instructions about the product. This User's Manual is intended for experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this Quick Installation, please consult your vendor before further handling.

Warning

Panel PC and their components contain very delicate Integrated Circuits (IC). To protect the Panel PC and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside.
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry.
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that came with the Single Board Computer, whenever components are separated from the system.
5. It possibly needs BIOS support in the case of using special backplane, otherwise, it might be not able to function completely.
6. Please make sure the power connector is tightly plugged into the power socket before power on.

Caution

"The unit is exclusive interconnection with IEC 60601 certified equipment outside the patient environment, and IEC 60601-1 certified equipment inside the patient environment."

"Caution: Only use the adapter provided (Model MPU100-107)."

"Caution: Please follow the national guideline for the unit disposal."

1.1 Getting Started

This section will help you have your M1525 up and running smoothly.

1.2 Packing List

Panel PC	1 x M1525
Accessory	1 x Power Cord (French Cord set)
Package	1 x Power Cord (American Cord set)
	1 x Quick Installation Guide
	1 x Arbor Driver CD
	1 x Power Adapter
	1 x Earphone Hook Bracket (for M1525/423-B22 only)
	1 x screws kit

Before up and running, please make sure the package contains all of above accessories.

If any of the above items is damaged or missing, contact your vendor immediately.

1.3 Ordering Information

M1525/423-B22	15"Medical Panel PC Gray w/Celeron M 423 1.06GHz/ 80G HDD/ 1G RAM/ Wireless LAN/ Bluetooth
M1525/T7400-B23	15"Medical Panel PC Gray w/Core 2 Duo T7400 2.16GHz/ 80G HDD/ 1G RAM/ Wireless LAN/ Bluetooth/ DVD Combo
ARM-150	VESA-75/100 Desktop LCD Monitor Arm

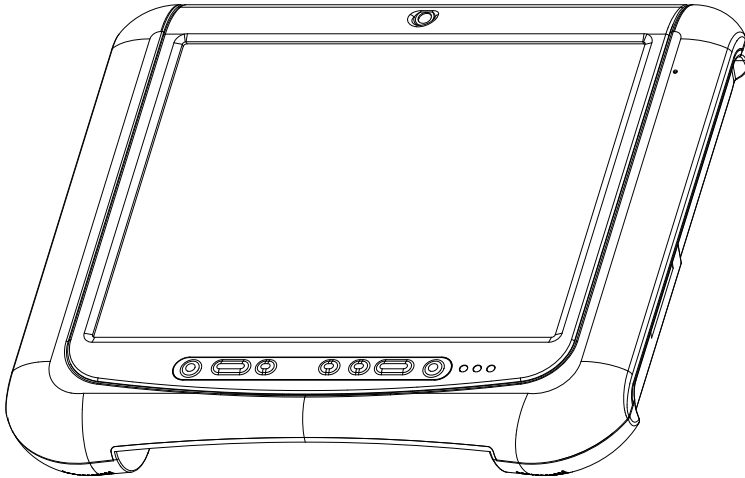
1.4 Specifications

Model Name	Medical Panel PC M1525	
System	CPU	Supports Intel Celeron M ULV 423 1.06GHz (Fanless) or Intel Core™ 2 Duo processor, up to T7400 2.16GHz, 4MB L2 Unified, FSB667/533MHz CPU
	Graphics Controller	Intel GMA950 Video Controller, up to 192MB shared memory
	Memory	2 x 200-pin SO-DIMM Socket, up to 4GB Dual Channel DDRII 667/533/400MHz SDRAM
	Chipset	Intel 945GME + ICH7M
	I/O Chips	Fintek F81216D + 1 x EC controller
	BIOS	AMI PnP Flash BIOS
	AUDIO	HD Audio supports MIC-In/ Line-out Two internal speakers (1.5W), MIC built-in
	LAN Controller	One Realtek 8111B 1000 base-T PCIe Gigabit LAN
	IDE Interface	1 x IDE for CD-ROM or DVD combo (M1525/ T7400-B23 only)
	Serial ATA	1 x SATA 300MB/s HDD transfer rate
	USB DOM	4G/ 8G (optional)
	Bluetooth	1 x Bluetooth module by USB interface
	Battery	7200mAh Li-battery pack built-in
	Expansion bus	1 x PCIe Mini-card (USB or PCIe Interface)
I/O	Serial Port	4 x RS-232 ports with Isolation
	USB Port	4 x USB 2.0 compliant ports
	KB/MS	1 x PS/2 Keyboard and Mouse Mini-DIN connector
	LAN	1 x RJ-45 connector
	Audio	1 x Line-out, One MIC-In
	VGA	1 x D-sub 15-pin female connector
	DVI	1 x DVI connector
	WiFi	1 x Wireless LAN 802.11b/g/n
	RJ-11	1 x RJ-11 for Input, 1 x RJ-11 for Output
Switches & Indicators	Smart Card Reader	1 x Smart Card Reader (By USB interface)
	Function Key	8 programmable button (F1 ~ F8)
	Power Button	On/Off Switch
	Battery Status	Battery LED (Red/Yellow)
	Power Status	Power LED (Red/Blue)
	IDE Status	IDE LED (Red/Green)

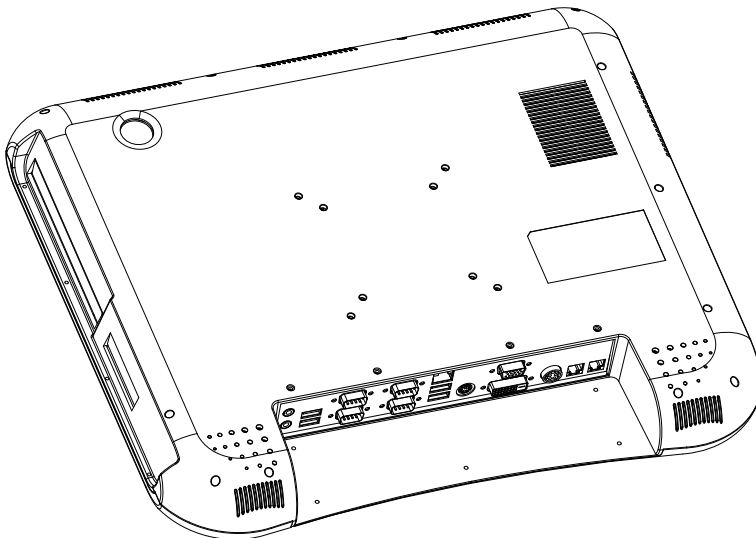
LCD Display	Size/ Type	15" TFT Color/ 1CH 18-bit LVDS
	Max. Resolution	1024 (H) x 768 (V), XGA
	Pixel Pitch	0.297mm x 0.297mm
	Max. Color	262,144 color
	Viewing Angle	120
	Contrast Ratio	500:1
	Luminance (cd/m2)	350
	LCD MTBF	50,000 hours
	Back Light MTBF	50,000 hours
Touch Screen	Type	Analog Resistive
	Resolution	Continuous
	Light Transmission	80%
	Controller Interface	USB Interface
	Power Consumption	5V/200mA
	Driver Supported	Windows/Linux
	Durability	30 Million
Storage	HDD/ Type	1 x 2.5" HDD bay
	Slim-ROM	1 x Slim Type CD-ROM driver
Power Adapter (MPU100-107)	AC Input	100-240VAC (Full-range)
	Frequency	47 ~ 63Hz
	DC Output	100W (Max.), 5A@20V
	Input Current (rms)	1.25A@115VAC, 0.5A@230VAC Max.
	Efficiency	88%@full load, 230VAC, Max.
Mechanical & Environment	Operating Temp.	0°C ~ 40°C (32°F ~ 104°F)
	Storage Humidity	5% to 95% non-condensing
	Vibration	17 to 500Hz, 1G PTP
	Shock	10G/peak (11m sec)
	Construction	Plastic
	Mounting	VESA-75 compatible or VESA 100
	Dimension (LxHxD)	410 x 60 x 350 mm (15.76" x 2.36" x 13.78")

1.5 Overview

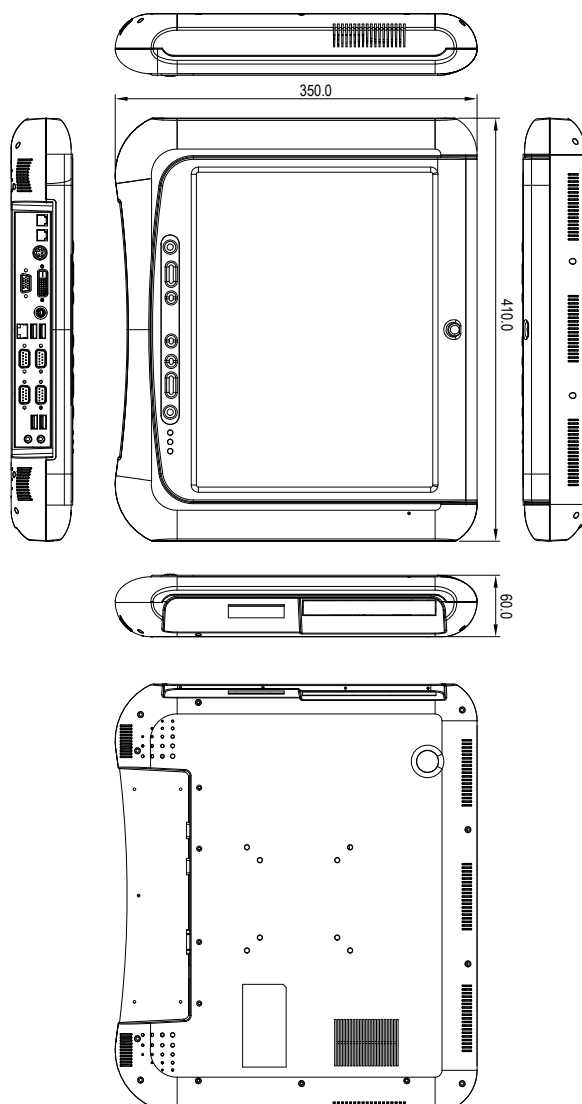
Front view



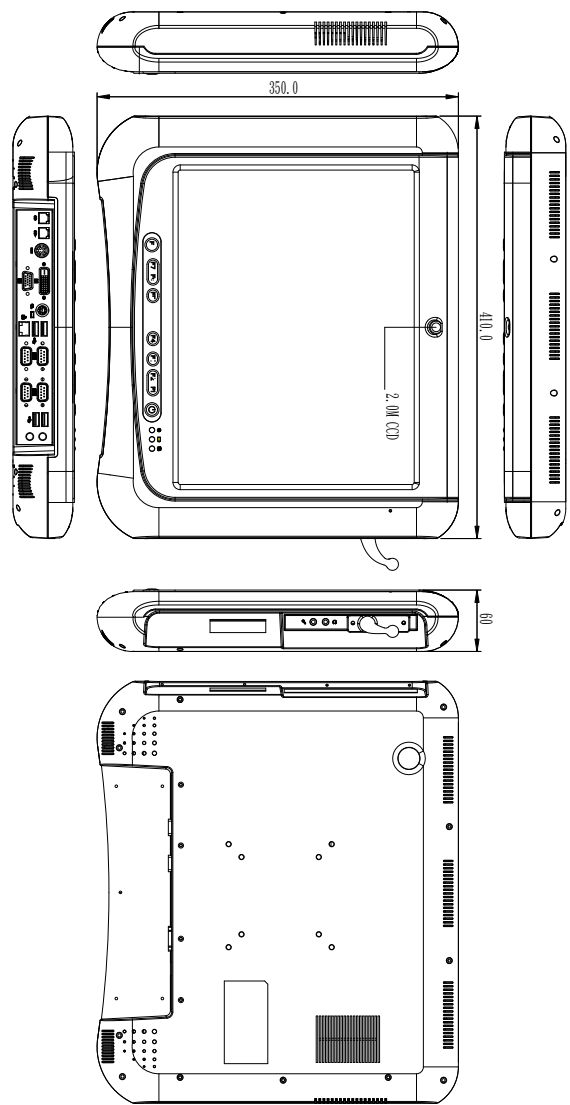
Rear view



1.6 Dimensions



M1525/T7400-B23

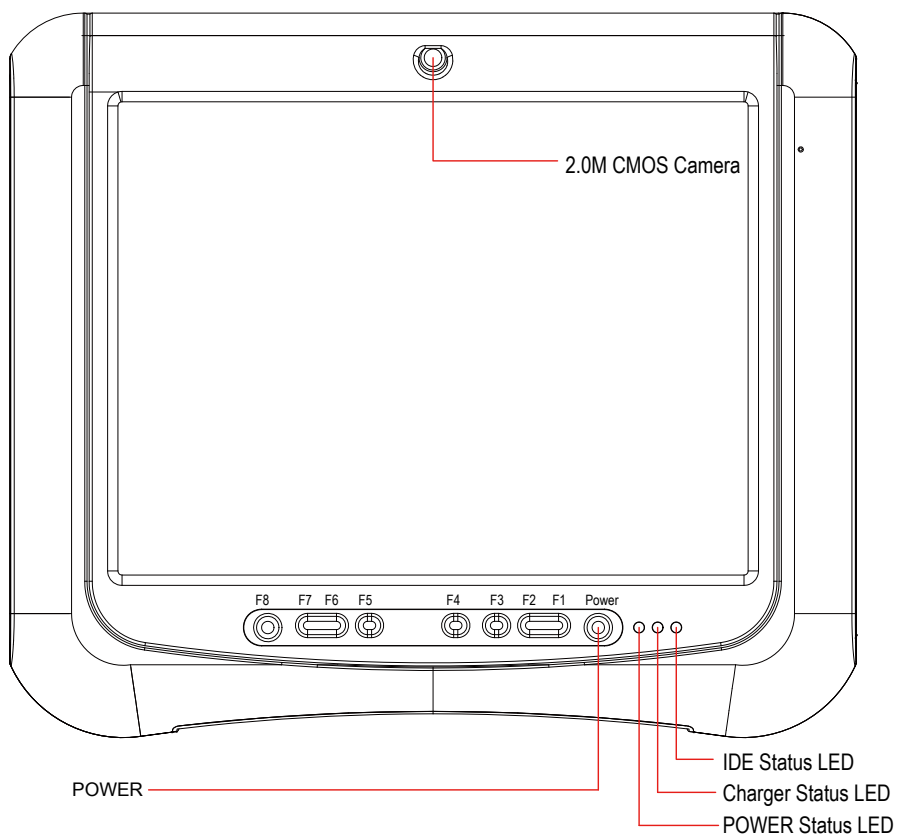


M1525/423-B22

1.7 Location of Switches and Indicators

The front panel contains indicators, switches, CMOS camera, OSD, Power switch, HDD LED, Battery status LED and Power On/Off LED indicators.

Front side



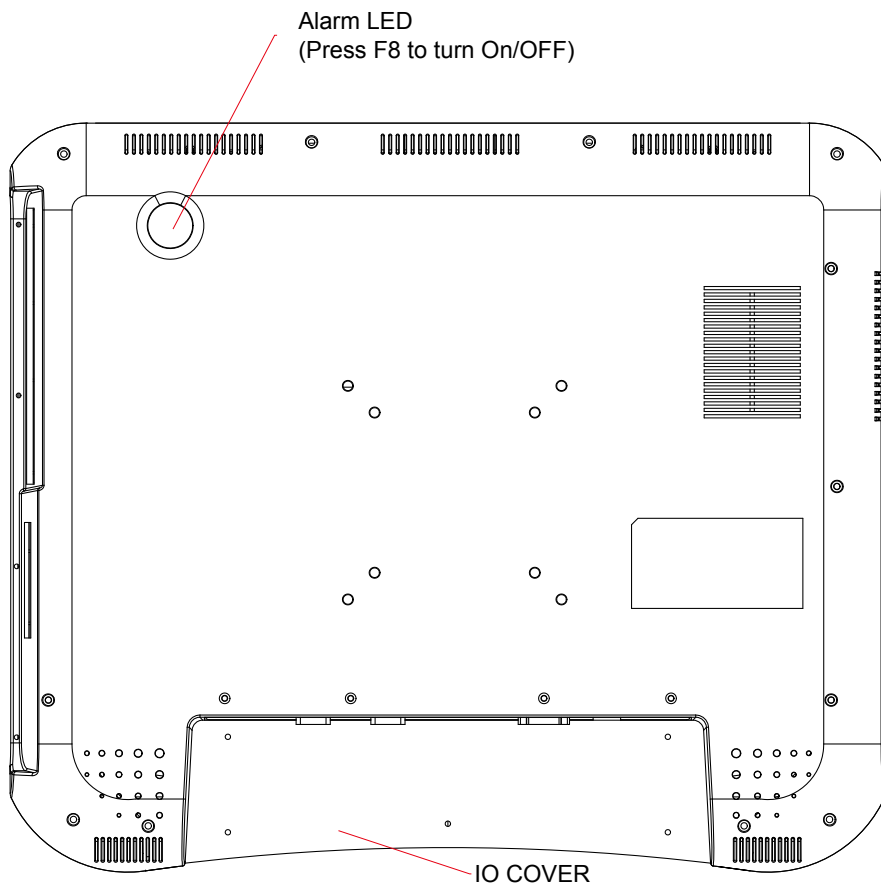
Rear side

The rear side contains alarm LED indicator that press F8 to turn On/OFF.
The function key F8 can programme the alarm LED to always ON or blink.

If you need any technical documentations to program function keys, please do not hesitate to call or e-mail our customer service.

<http://www.arbor.com.tw>

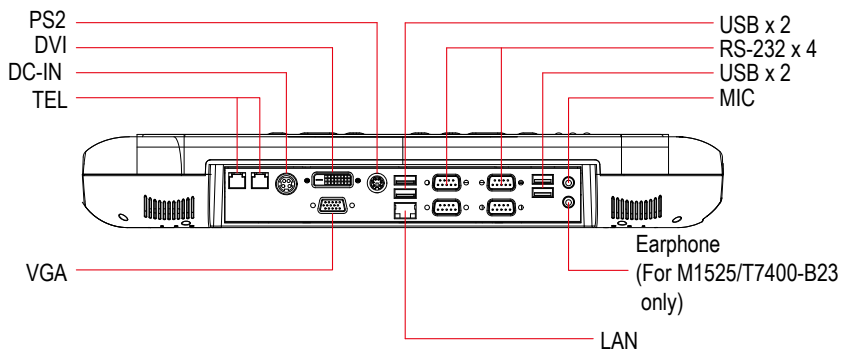
E-mail: info@arbor.com.tw



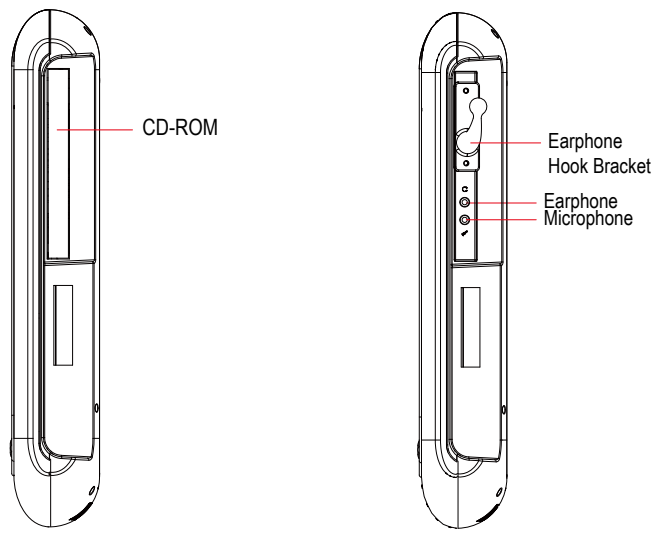
1.8 Location of I/O ports

Before starting to install software on your new Penal PC please spend some time to find out the exact location of connectors.

Bottom side



Right side



M1525/T7400-B23

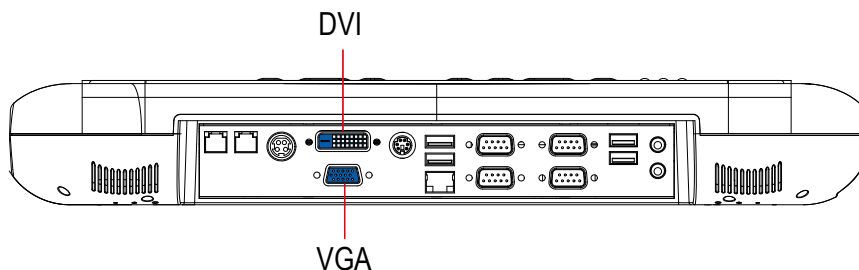
M1525/423-B22

1.9 Connecting Peripherals

The user can use the I/O interfaces located at the backside of the chassis to connect external peripheral devices, such as a mouse, a keyboard, a monitor, serial devices or parallel printer etc. Before connection make sure that the computer and the peripheral devices are turned off.

1.9.1 Connecting an external CRT

M1525 has a 15-pin analog RGB interface connector and a DVI connector located at the bottom side of the chassis for connection a secondary display. The system can support simultaneous display on both its LCD display and on the external CRT display. Note that the preferred resolution is 1024 x 768 because this is what the LCD Panel needs to operate full screen.



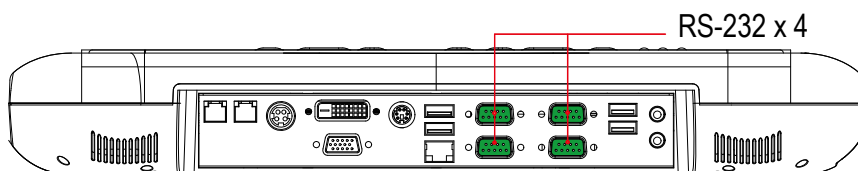
1.9.2 External Serial Ports (COM1/2/3/4)

The M1525 logic board supports four onboard serial ports, all COM ports supports RS-232.

The external COM1, COM2, COM3 and COM4 are all D-SUB 9-pin male connectors.

To connect any serial device, follow the steps below:

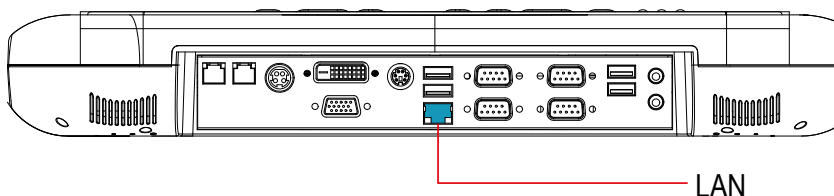
1. Turn off the Medical Panel PC system and the serial devices.
2. Attach the interface cable of the serial device to the 9-pin D-SUB serial connector. Be sure to fasten the retaining screws.
3. Turn on the computer and the attached serial devices.
4. Refer to the serial device's manual for instruction to configure the operation environment to recognize the new attached devices.
5. If the serial device needs specified IRQ or address, you may need to run the CMOS setup to change the hardware device setup.



1.9.3 LAN Port

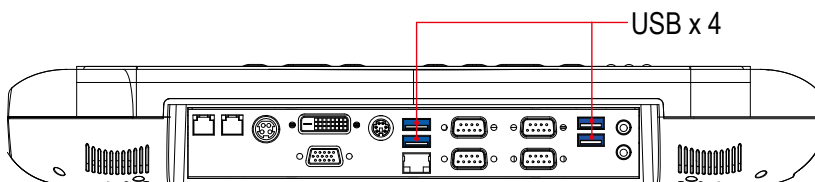
M1525 provides one Realtek 8111B 10/100/1000 Base-T Ethernet (RJ-45) interface. For network connection, follow the instructions below;

1. Turn off the Medical Panel PC system and the Ethernet hubs.
2. Plug in one end of cable of a 10/100/1000 Base-T hub to the system's RJ-45 jack.



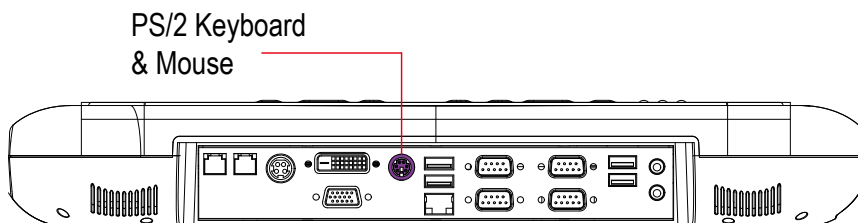
1.9.4 USB Ports

M1525 provides four external USB ports to connect to external USB devices. USB ports and devices are hot plug capable. Therefore any USB device can be connected at all time without the need to power down your system. Note that for many of these devices you will first have to install proper device drivers before they can be recognized by the system.



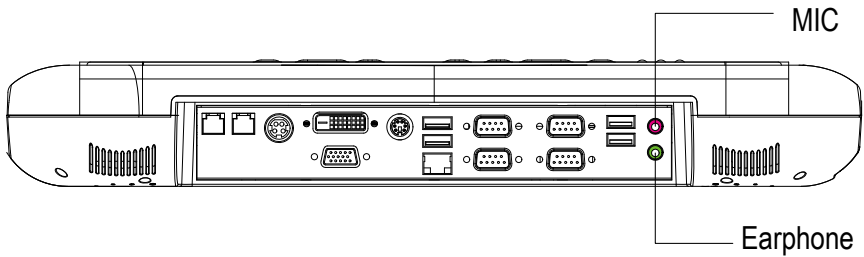
1.9.5 PS/2 Keyboard/Mouse

M1525 provides one PS/2 keyboard/mouse connector located at the bottom side. If the user would like to use AT keyboard, then an adapter to connect the PS/2 Keyboard to AT Keyboard is needed.



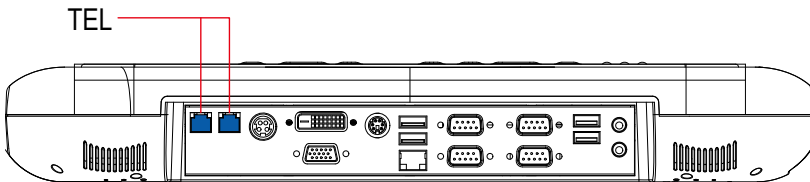
1.9.6 Audio Line-Out/ MIC-In

M1525 provides two Audio jacks for Line-Out and MIC-In located at the bottom side.



1.9.7 TEL Port

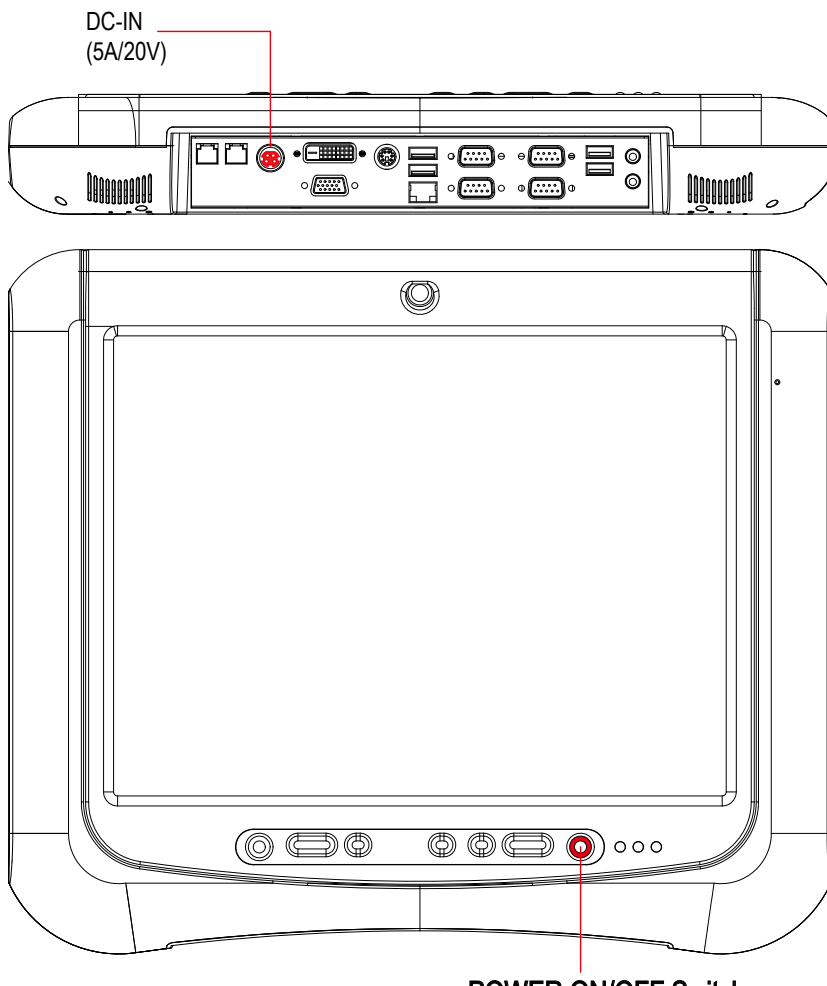
M1525 provides two RJ-11 line connectors (bypass only) for a standard telephone cable.



1.9.8 DC Power Input and Power Switch

One end of the power cable is fitted with a standard power connector that connects to any normal wall outlet (types differ per country). To connect the system to power, follow the following instructions :

1. Make the system power switched off.
2. Plug the circular connector firmly into the circular socket on the bottom side.
3. Connect the Mini-DIN.
4. For operation, power up the system.



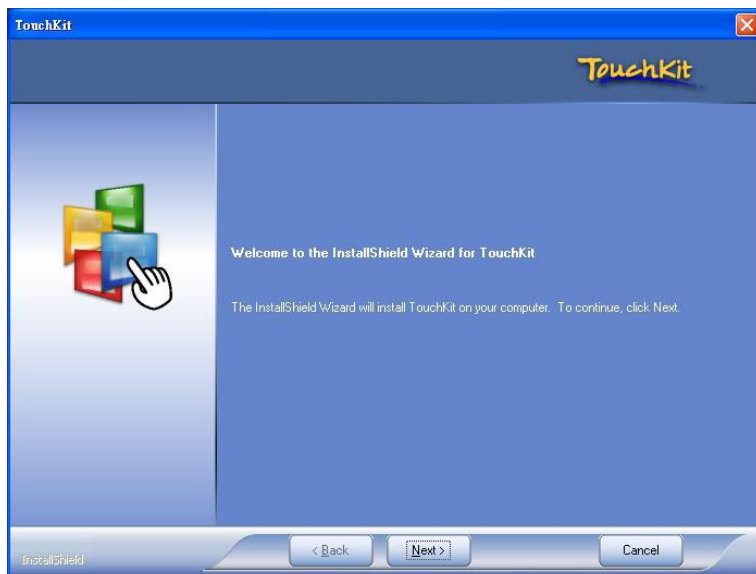
1.10 Driver Installation

1.10.1 Touch Screen

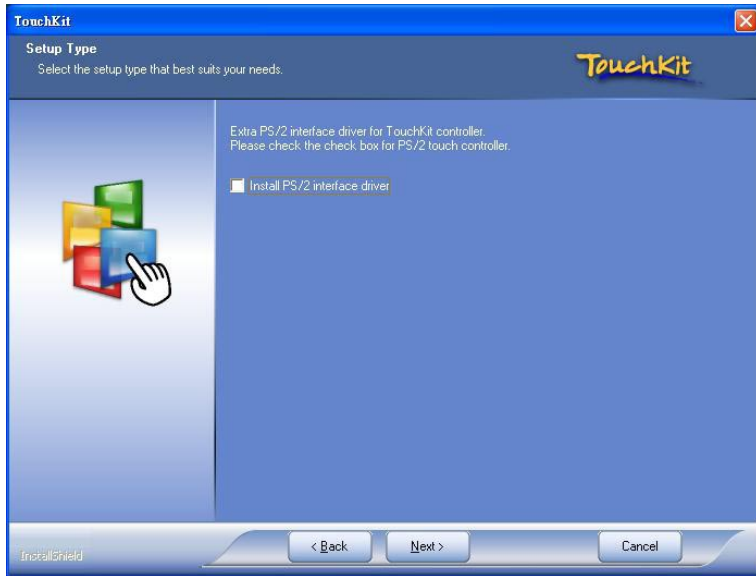
1. In Arbor's Driver and Utility, choose Touch Panel.



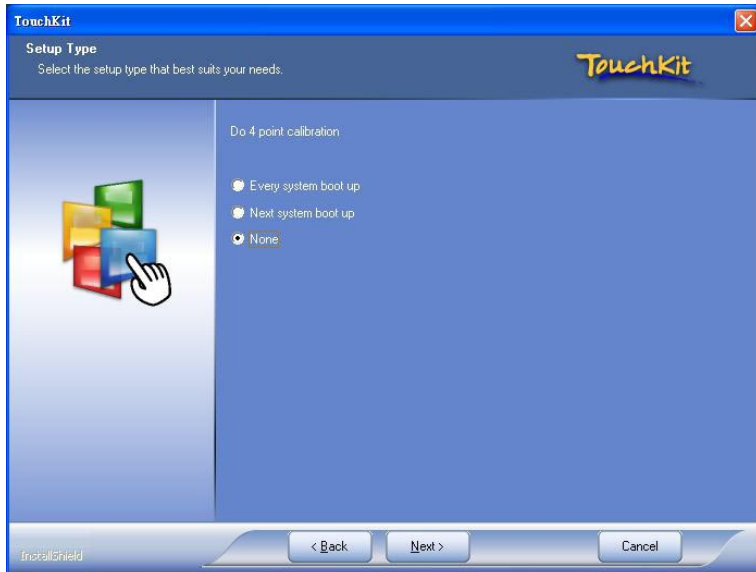
2. In Welcome to TouchKit Setup, Press "Next"



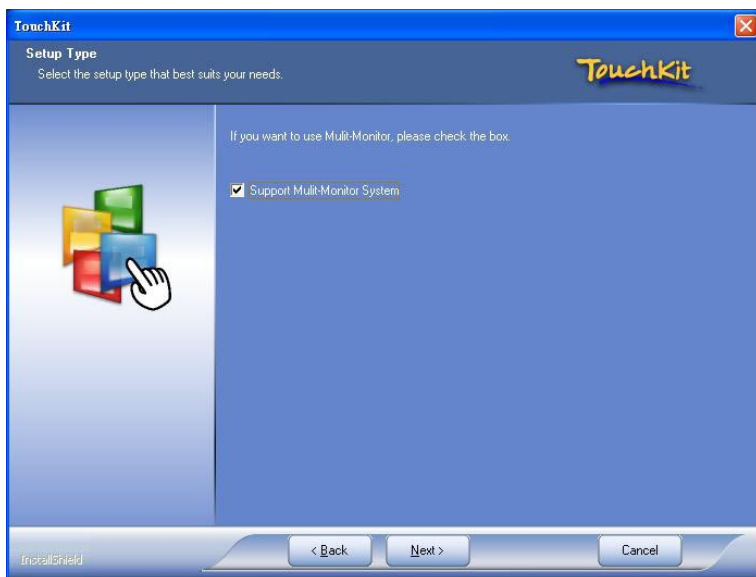
3. Please check the check box for PS/2 touch controller, then press “Next”.



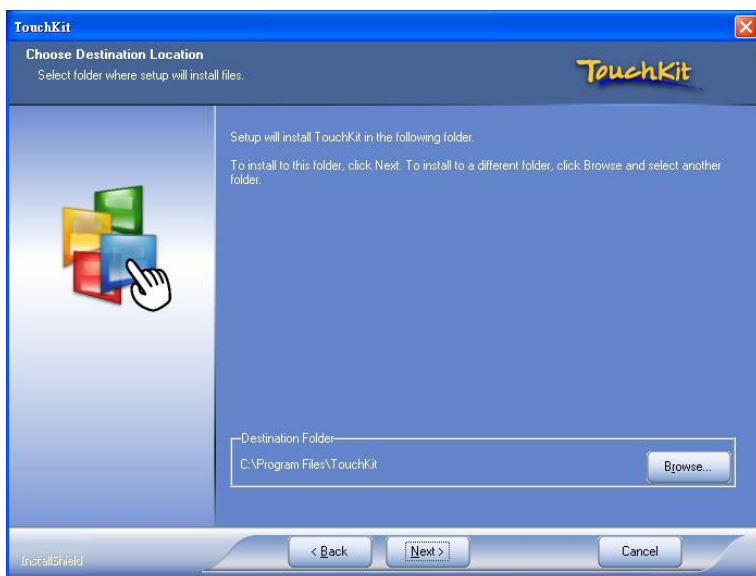
4. Do 4 point calibration, select a mode and press “Next”.



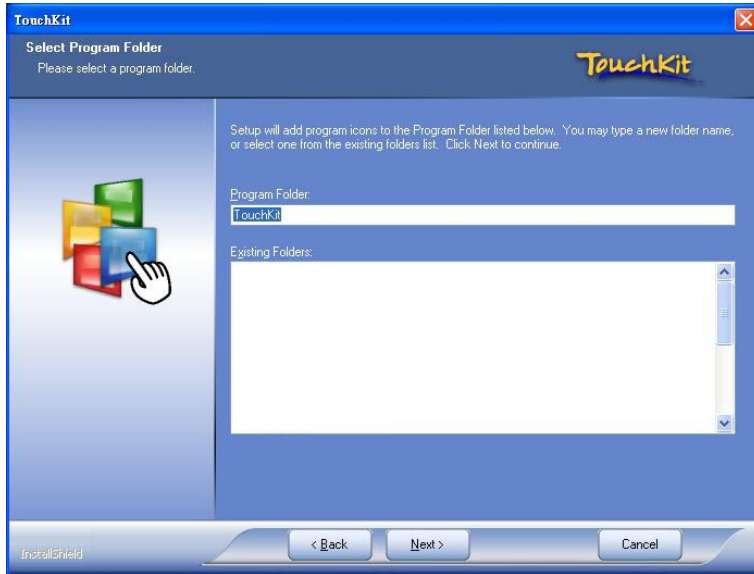
5. If you want to use Multi-Monitor, please check the box.



6. Select folder where setup will install files.



7. Please select a program folder than press “Next”.

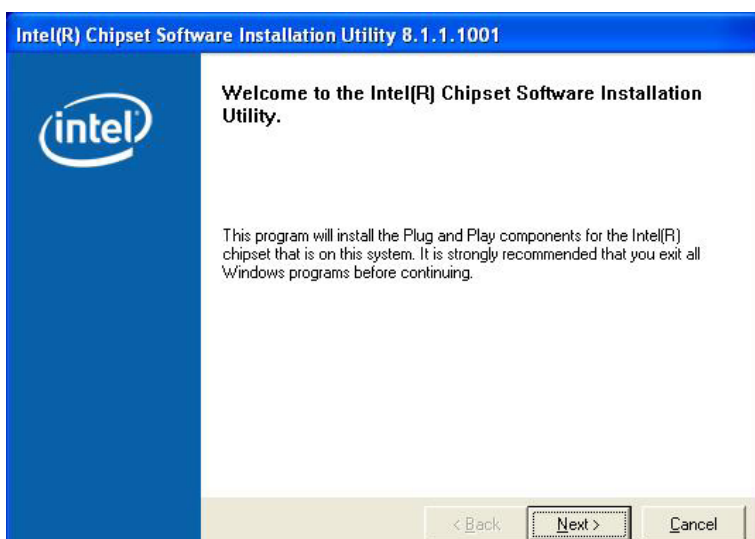


1.10.2 Chipset driver installation

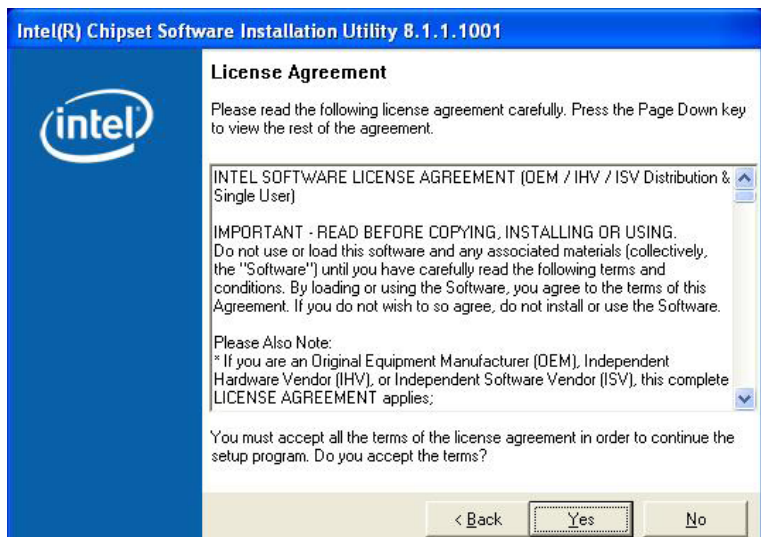
1. In Arbor's Driver and Utility, choose Chipset.



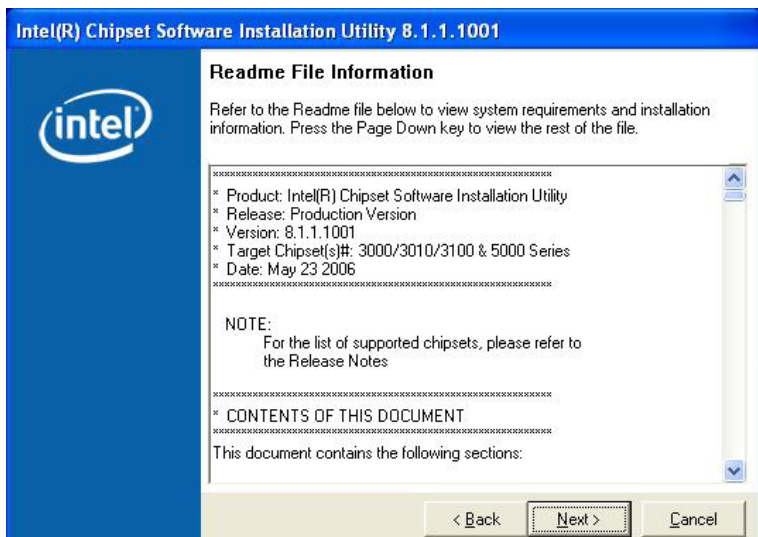
2. In Welcome to Chipset Setup, Press "Next"



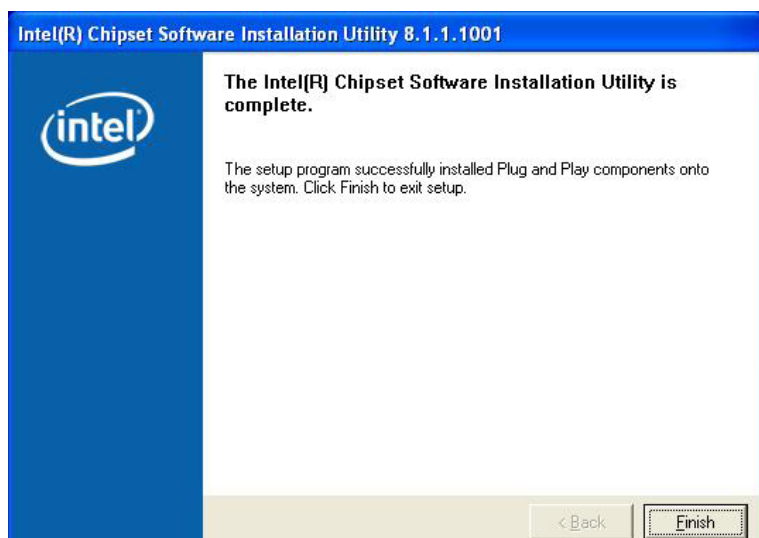
3. License Agreement, press “Yes”.



4. Press “Next”

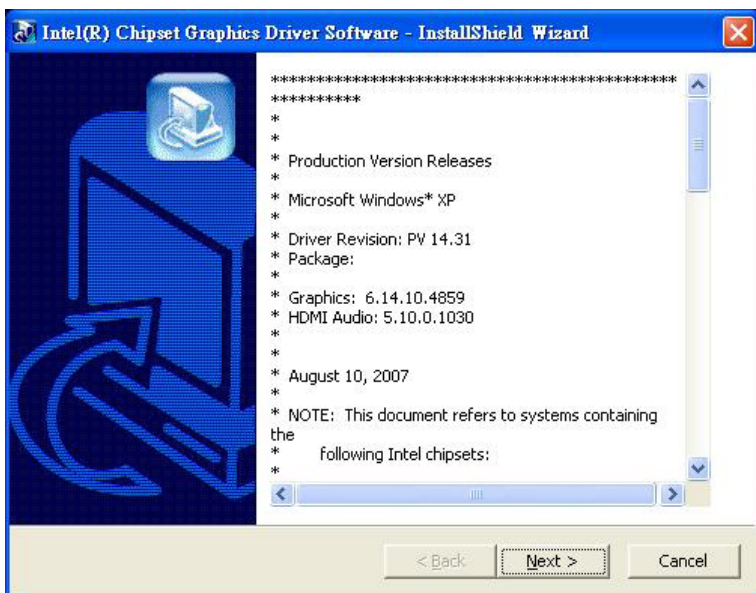


5. Press “Finish”.



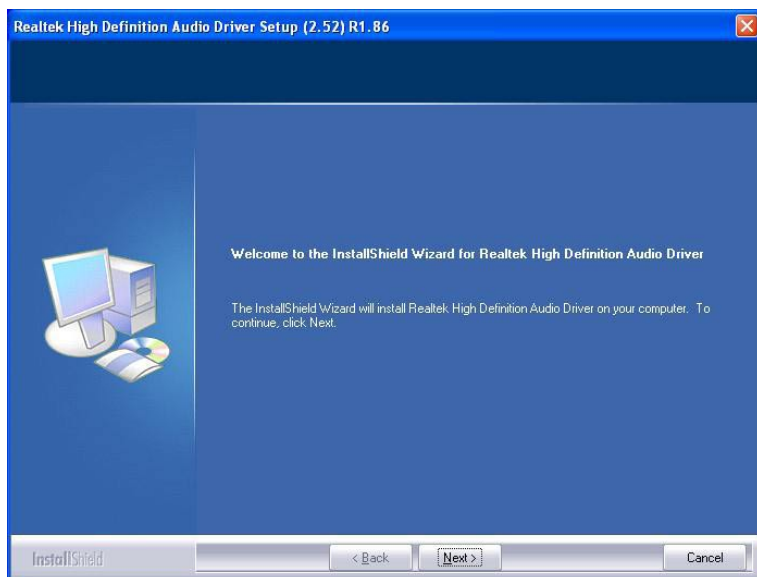
1.10.3 Graphic driver installation

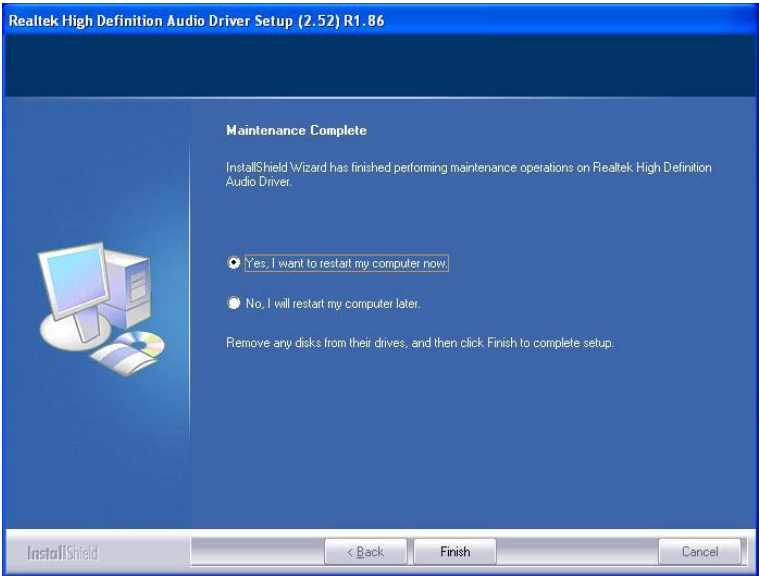
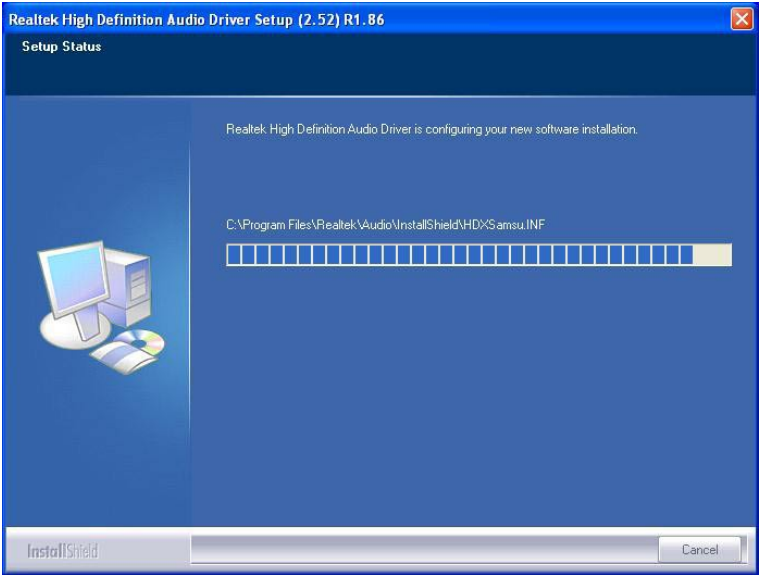
1. In Arbor's Driver and Utility, choose VGA.



1.10.4 Audio driver installation

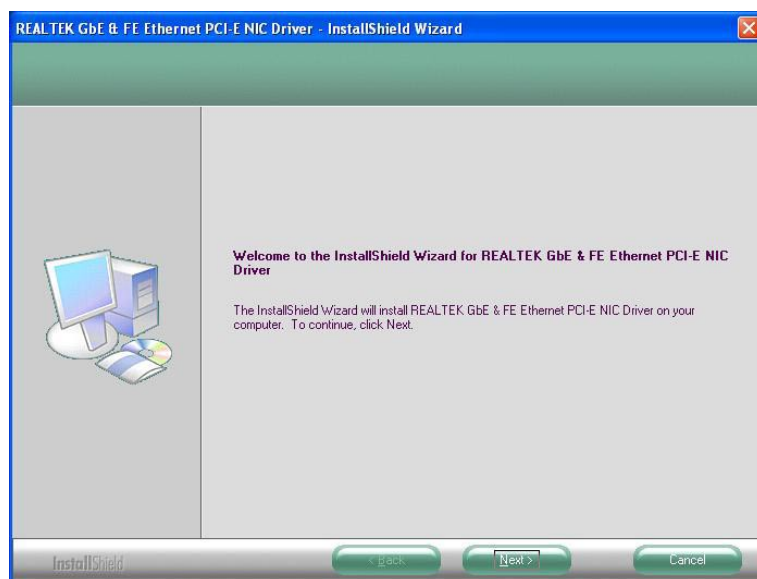
1. In Arbor's Driver and Utility, choose Audio.

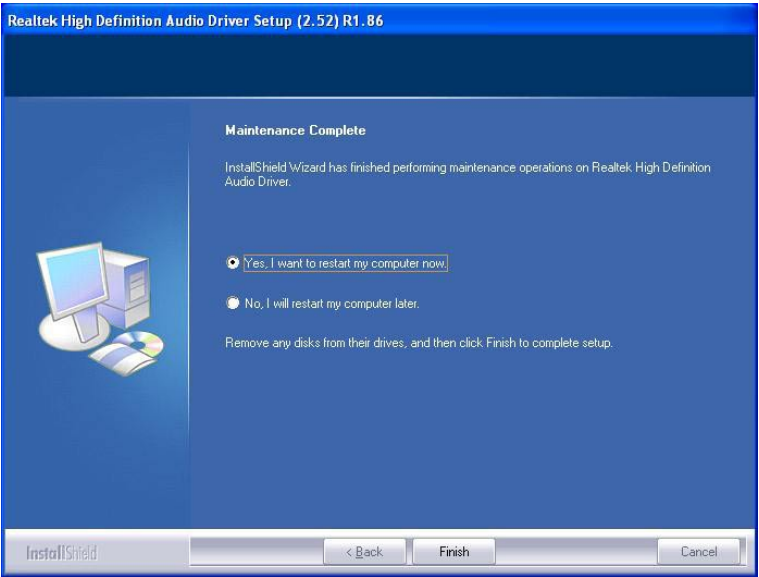
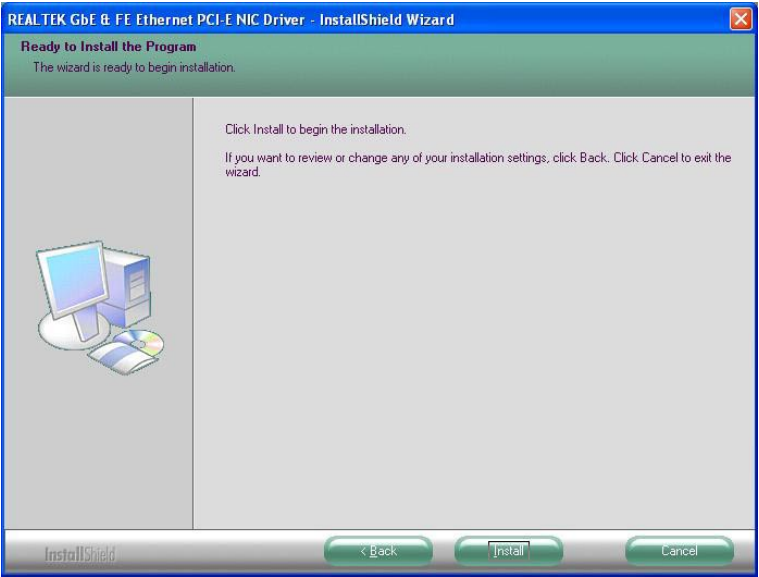




1.10.5 LAN driver installation

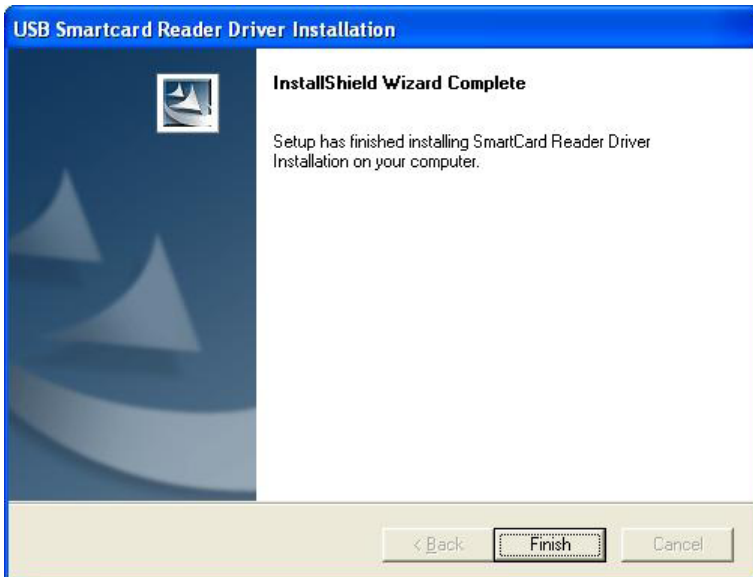
1. In Arbor's Driver and Utility, choose LAN.





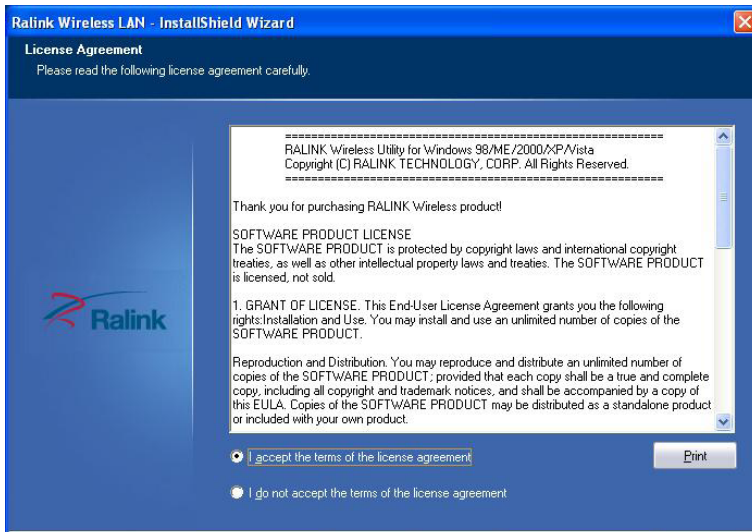
1.10.6 SmartCard Reader driver installation

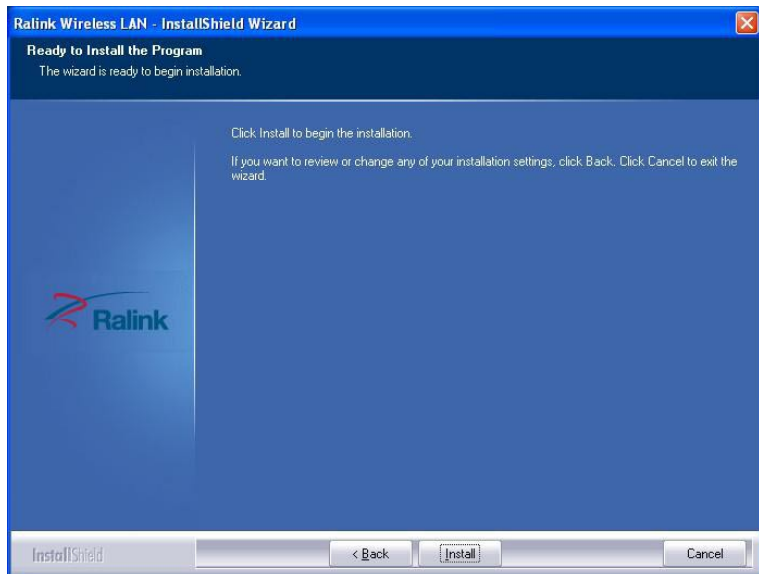
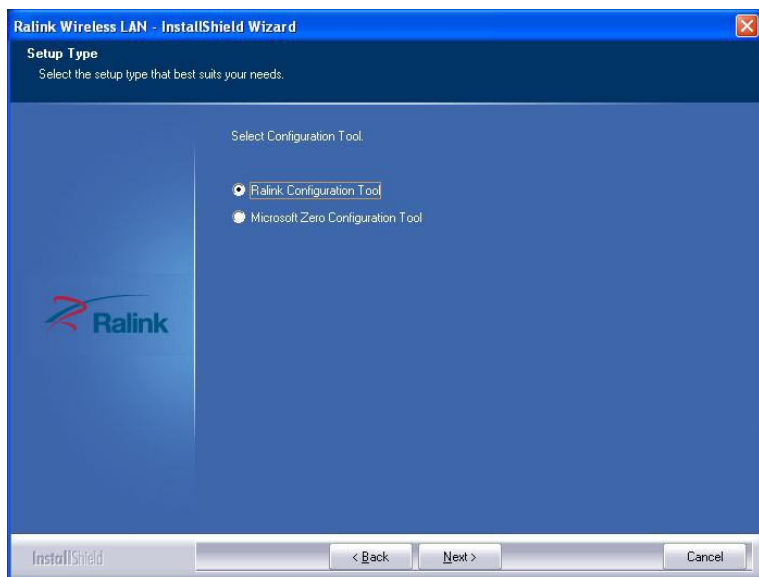
1. In Arbor's Driver and Utility, choose SmartCard Reader.

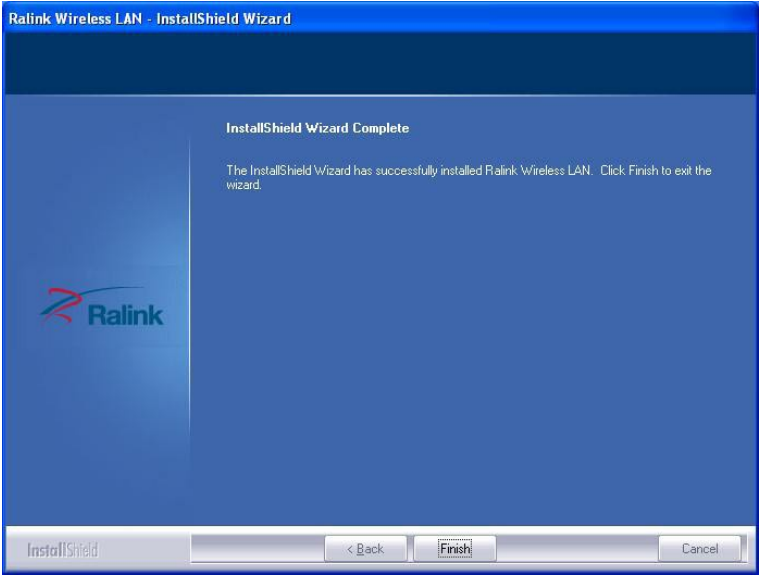
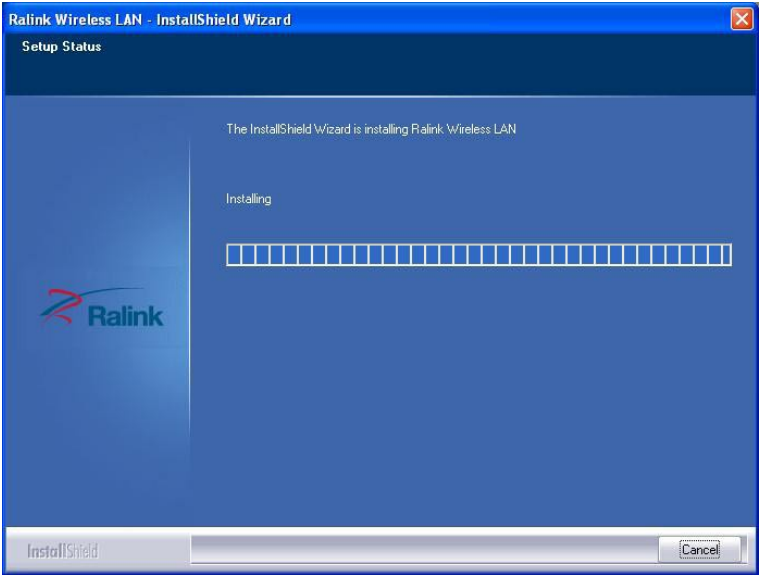


1.10.7 Wireless LAN driver installation

1. In Arbor's Driver and Utility, choose Wireless LAN.

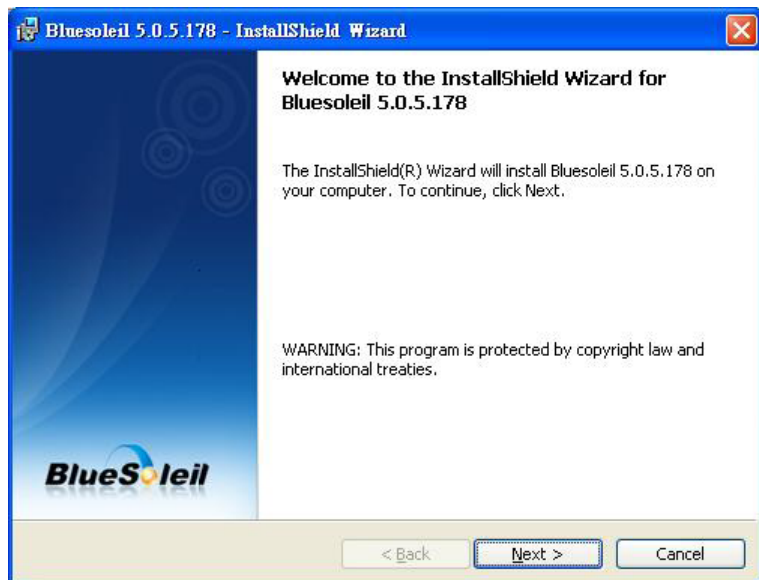


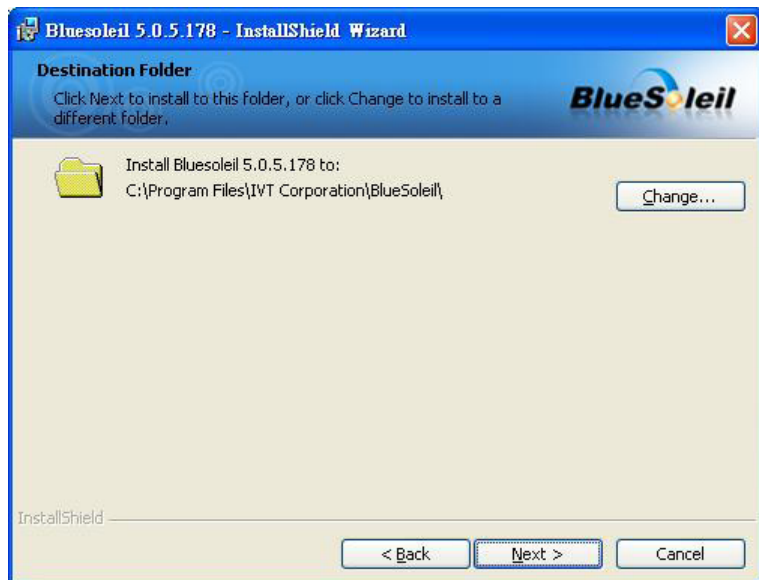


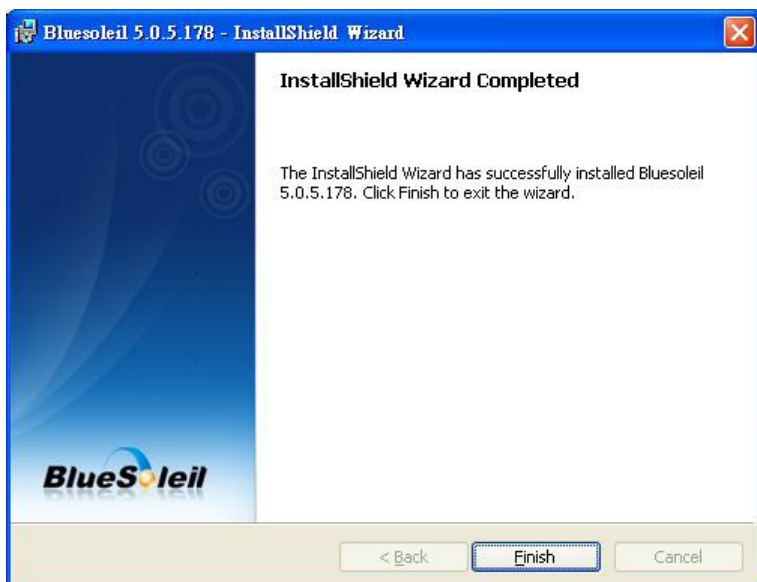
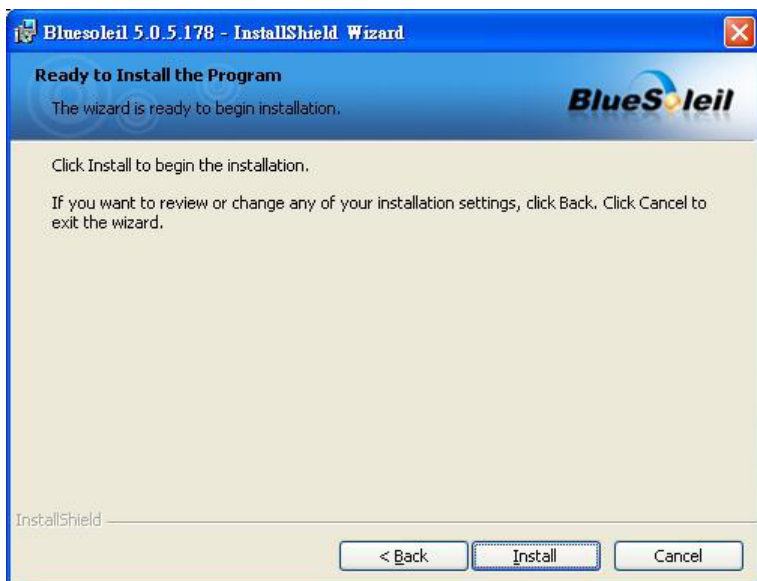


1.10.8 Bluetooth driver installation

1. In Arbor's Driver and Utility, choose Bluetooth.







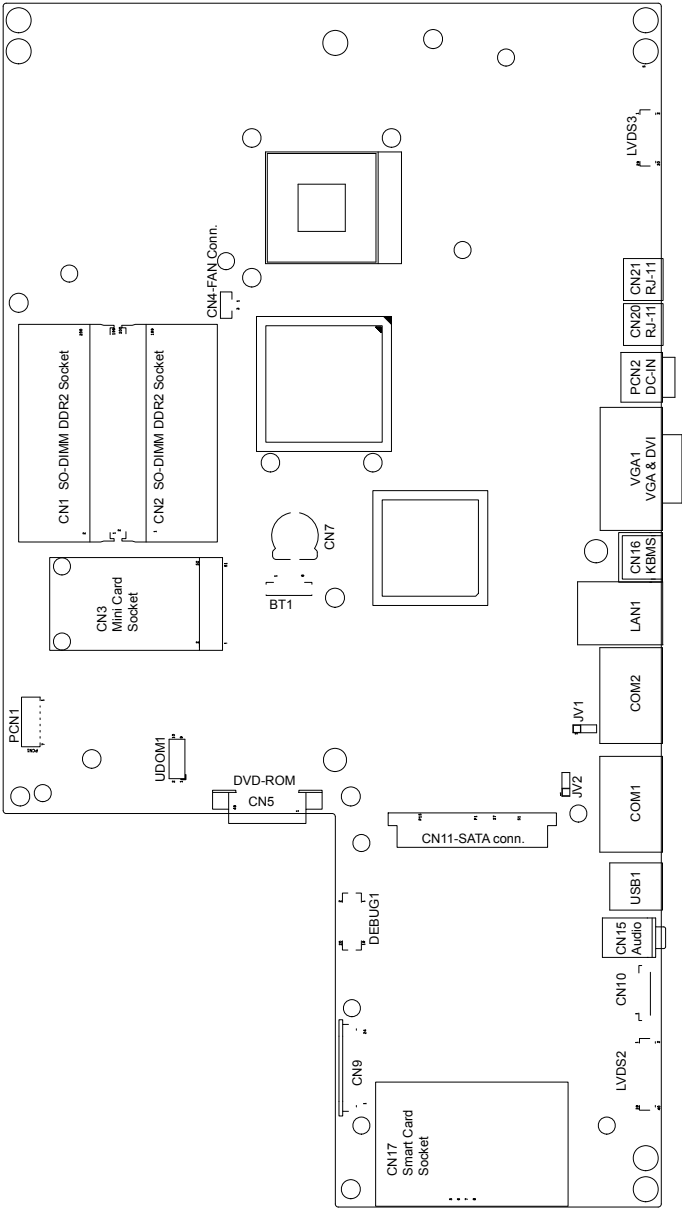
Chapter 2

Board Installation

2.1 Board Specifications

Product Name	MB-i9454
Processor	Supports Intel Celeron M ULV 423 1.06GHz (Fanless) or Intel Core™ 2 Duo processor, up to T7400 2.16GHz, 4MB L2 Unified, FSB667/533MHz CPU
Chipset	Intel 945GME + Intel ICH7M
System Memory	2 x 200-pin DDRII SO-DIMM socket Up to 4GB
VGA/LCD Controller	Integrated with Intel® Graphics Media Accelerator (GMA950) CRT and LVDS support (dual mode independent display)
Ethernet	1 x Realtek 8111B 10/100/1000Mbps Fast Ethernet
I/O Chips	ITE-8512E
BIOS	AMI PnP Flash BIOS
Audio	HD Codec, MIC-in/Line-out
IDE	1 x IDE DVD-ROM drive
Serial ATA	1 x Serial ATA 300MB/s HDD transfer rate
Serial Port	4 x Serial Port COM1, 3: Supports +5V power pin
KBMS	Standard PS/2 Keyboard and Mouse
Universal Serial Bus	4 x USB 2.0 compliant
VGA	LVDS / DVI/ CRT
Expansion Interface	1 x MiniCard socket
RTC	Real Time Clock
Power Input Connector	DC-in +20V/5A (AC power adapter)
Operation Temp.	0°C ~ 40°C (32°F ~ 104°F)

2.2 Jumpers and Connectors location



2.3 Jumper / Connector Quick Reference

I/O Connectors

Label	Function
VGA1	CRT & DVI Display
LAN1	RJ-45 LAN Ethernet Connector USB Port 1, 2
COM1 ~ COM4	RS-232 Serial Ports
CN5	DVD-ROM connector (IDE1)
CN9	Keyboard matrix interface connector
CN15	MIC-in, Line-out phone jack
CN16	PS/2 Keyboard and Mouse
CN20, CN21	Telephone RJ-11 connectors
PCN2	DC-IN connector
USB1	USB Port 3, 4

Jumpers

Label	Function
JV1, JV2	COM port special +5V Voltage Select

Connectors

CN1, CN2	200-pin SO-DIMM DDRII socket
CN3	Mini Card socket
CN4	FAN power connector
CN10	Audio Interface Port
CN11	Serial ATA connector
CN17	Smart Card socket
LVDS2	LED indicators & hot key connector
LVDS3	LVDS connector
UDOM1	USB port connector

CN5: DVD-ROM Connector

Connector type: Right angle 2x25-pin connector

Pin	Description	Pin	Description
1	CD-L	2	CD-R
3	CD_GND	4	GND
5	IDE RESET	6	DATA8
7	DATA7	8	DATA9
9	DATA6	10	DATA10
11	DATA5	12	DATA11
13	DATA4	14	DATA12
15	DATA3	16	DATA13
17	DATA2	18	DATA14
19	DATA1	20	DATA15
21	DATA0	22	REQ
23	GND	24	IO READ
25	IO WRITE	26	GND
27	IO READY	28	DACK
29	IRQ15	30	IOCS16
31	ADDR1	32	CD_DET
33	ADDR0	34	ADDR2
35	CS1#	36	CS3#
37	IDEACTP	38	+5V
39	+5V	40	+5V
41	+5V	42	+5V
43	GND	44	GND
45	GND	46	GND
47	M_S_SET	48	GND
49	NC	50	NC

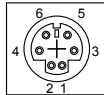
CN15: Audio Connector

The CN15 composed of Earphone and Microphone jacks.



CN16: Mini-DIN Keyboard & Mouse Connector

Pin	Description
1	KB Data
2	MS Data
3	GND
4	+5V
5	KB Clock
6	MS Clock

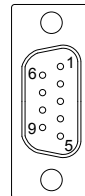


Note: KBM1 supports PS/2 keyboard directly, and PS/2 mouse supported with the additional PS/2 1-to-2 cable.

COM1~4: RS-232 Connectors

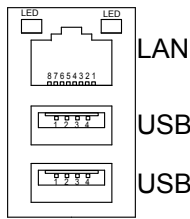
Connector type: D-Sub 9-pin male.

Pin	Description	Pin	Description
1	DCD#	6	DSR#
2	RXD	7	RTS#
3	TXD	8	CTS#
4	DTR#	9	RI#
5	GND		



LAN1: 1 x RJ-45 + 2 x USB

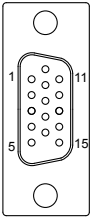
LAN1 supports one Ethernet and two USB 2.0 connectors w/ 480MB/s.
Connector type: RJ-45 + double stack USB type A.



VGA1: CRT Connector

Connector type: D-Sub 15-pin female.

Pin	Description	Pin	Description
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	VDDAT
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	VDCLK
8	GND		

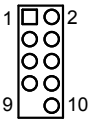


UDOM1: USB Connector

The board supports one header UDOM1 that can connect high-speed (Data transfers at 480MB/s), full-speed (Data transfers at 12MB/s) or low-speed (Data transfers at 1.5MB/s) USB devices.

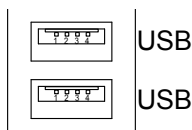
Connector type: 2.00mm 2x5 pin header

Pin	Description	Pin	Description
1	+5V	2	N/C
3	USBD-	4	N/C
5	USBD+	6	N/C
7	GND	8	N/C
9	N/C (Key)	10	N/C



USB1: USB ports

Connector type: double stack USB type A.



LVDS2: LED & Hot key Connector

Pin	Description	Pin	Description
1	+3.3V	2	+3.3V
3	PWR_LED#	4	DTV_SW
5	CHG_LED#	6	DTV_UP_SW
7	BATTLO_LED#	8	DTV_DWN_SW
9	TMODE_LED#	10	SOUND_UP_SW
11	SUS_LED#	12	SOUND_DWN_SW
13	CD_LED#	14	SKYPE_SW
15	SATA_LED#	16	PWR_SW
17	INT_MIC	18	GND
19	GND	20	GND
21	SPKL1+	22	VREF
23	SPKL1-	24	BTLED
25	SPKR-	26	FUNCTION1
27	SPKR+	28	FUNCTION2
29	+5V	30	+3.3V
31	CCD_VCC	32	USB_DATA5+
33	USB_DATA7+	34	USB_DATA5-
35	USB_DATA7-	36	GND
37	GND	38	+5V
39	GND	40	GND

LVDS3: LVDS LCD Connectors

Pin	Description	Pin	Description
2	VDD	1	VDD
4	TX1CLK+	3	TX2CLK+
6	TX1CLK-	5	TX2CLK-
8	GND	7	GND
10	TX1D0+	9	TX2D0+
12	TX1D0-	11	TX2D0-
14	GND	13	GND
16	TX1D1+	15	TX2D1+
18	TX1D1-	17	TX2D1-
20	PNLSW1	19	PNLSW2
22	TX1D2+	21	TX2D2+
24	TX1D2-	23	TX2D2-
26	GND	25	GND
28	BKLTEN	27	BRIGHTADJ
30	+12V	29	+12V

PCN2: DC Power Input

Pin	Description
1	+20V
2	+20V
3	GND
4	GND



Connector type: Mini DIN.

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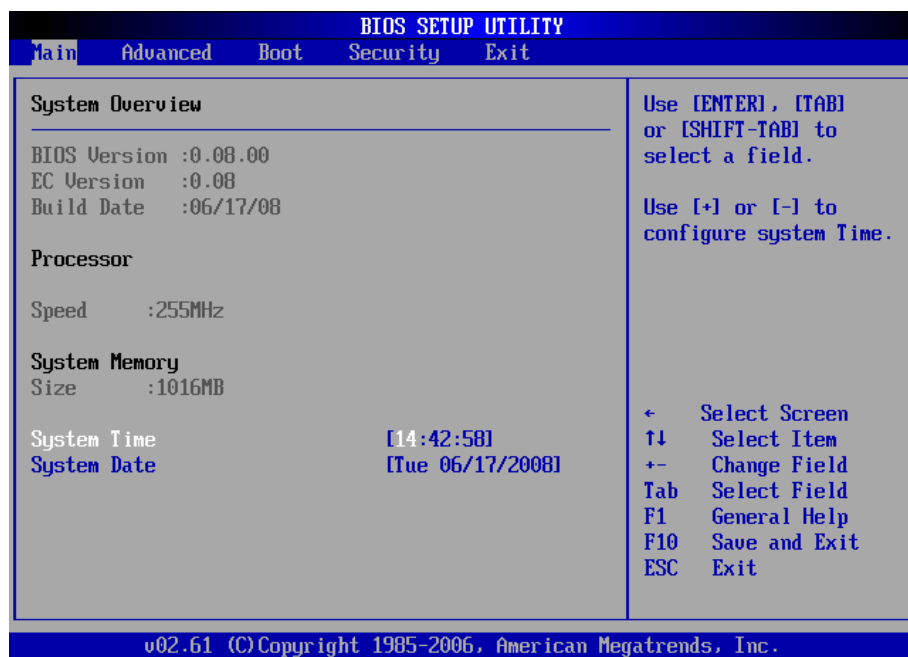
Chapter 3

BIOS

3.1 BIOS Main Setup

The AMI BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility.

When you turn on the computer, the AMI BIOS is immediately activated. The Main allows you to select several configuration options. Use the left/right arrow keys to highlight a particular configuration screen from the top menu bar or use the down arrow key to access and configure the information below.



System Time

Set the system time.

The time format is:

Hour : 00 to 23

Minute : 00 to 59

Second : 00 to 59

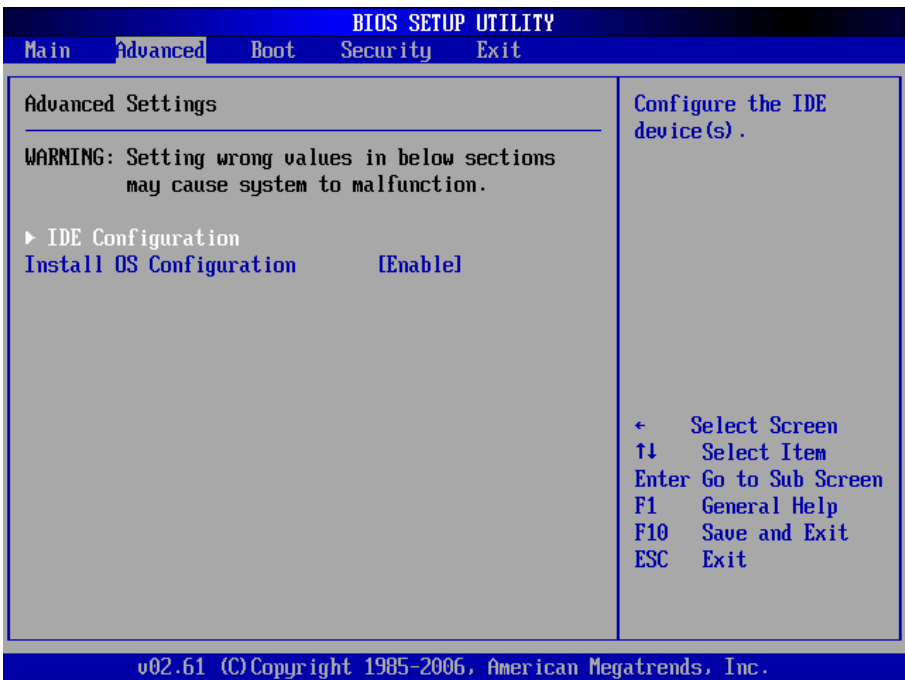
System Date

Set the system date. Note that the 'Day' automatically changes when you set the date.

The date format is:

- Day** : Sun to Sat
- Month** : 1 to 12
- Date** : 1 to 31
- Year** : 1999 to 2099

3.2 Advanced Settings



3.2.1 IDE Configuration

Primary/Secondary/Third IDE Master/Slave

Select one of the hard disk drives to configure it. Press <Enter> to access its the sub menu.

SATA#1 Configuration

Enable - Enable SATA configuration.

Disabled - Disable SATA configuration

Configure SATA#1 as

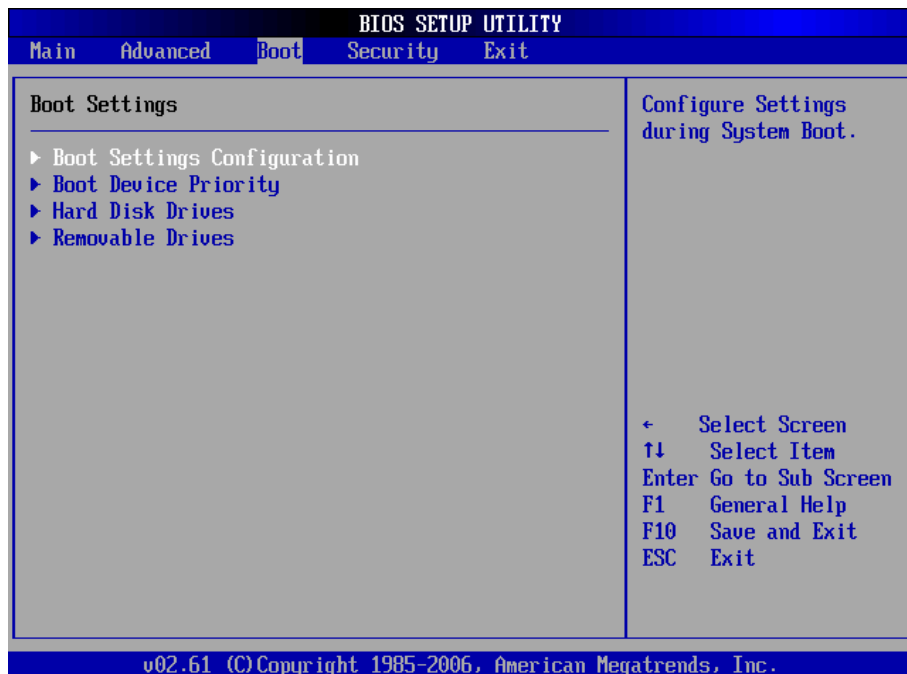
This BIOS feature controls the SATA controller's operating mode.

There are two available modes - IDE and RAID. When set to:

RAID - the SATA controller **enables** its RAID and AHCI functions when the computer boots up.

IDE - the SATA controller **disables** its RAID and AHCI functions when the computer boots up.

3.3 Boot Settings



Boot Device Priority

Press Enter and it shows Bootable add-in devices.

Removable Drives

Press Enter and it shows Bootable and Removable drives.

3.3.1 Boot Settings Configuration

Quick Boot

Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.

Bootup Num-Lock

Set this value to allow the Number Lock setting to be modified during boot up.

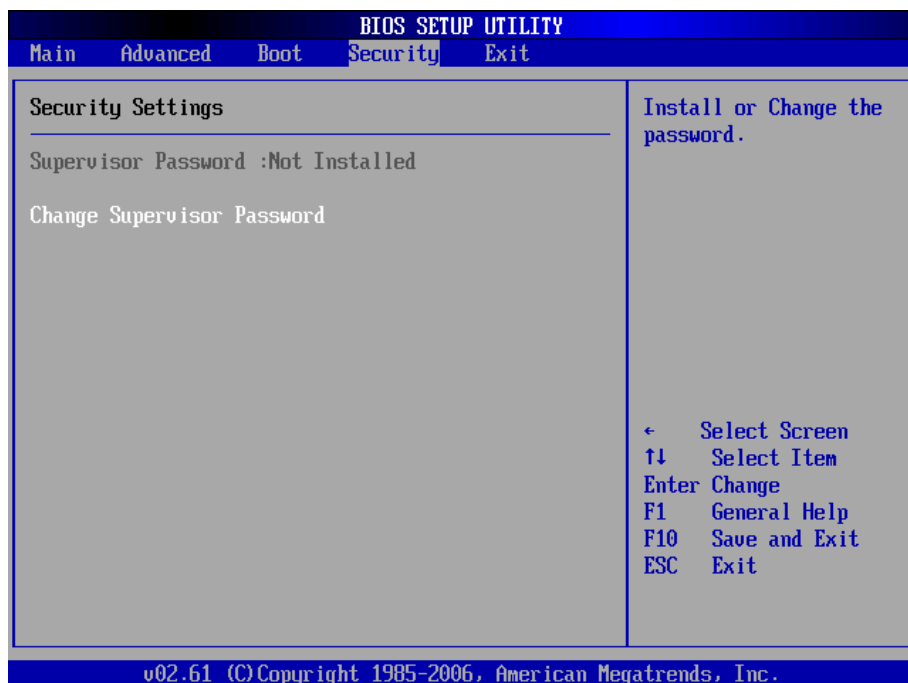
Interrupt 19 capture

Enabled: Allows option ROMs to trap interrupt 19. This is required by some PCI cards that provide a ROM based setup utility.

LAN Boot Function

Set this option to LAN add-on Boot ROM function.

3.4 Security



Supervisor Password & User Password

You can set either supervisor or user password, or both of them. The differences between are:

Set **Supervisor Password**: Can enter and change the options of the setup menus.

Set **User Password**: Just can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <ESC> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

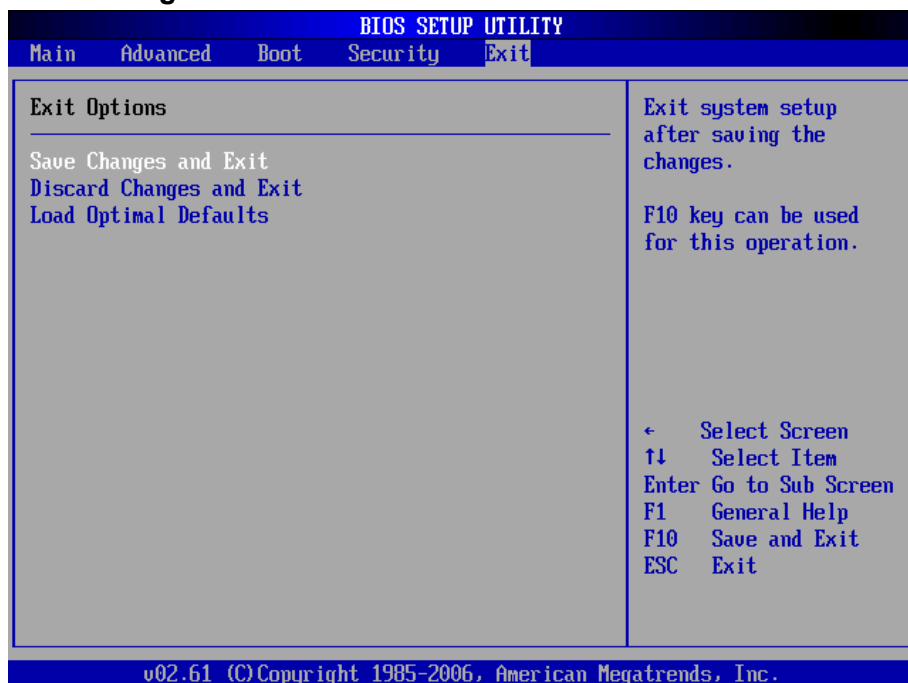
You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

Boot Sector Virus Protection

Enable/Disable Boot Sector Virus Protection.

3.5 Exit Options

Save Changes and Exit



Pressing <Enter> on this item asks for confirmation:

Save configuration changes and exit setup?

Pressing <OK> stores the selection made in the menus in CMOS - a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Discard Changes and Exit

Exit system setup without saving any changes.

<ESC> key can be used for this operation.

Load Optimal Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message:

Load Optimal Defaults?
[OK] [Cancel]

Pressing [OK] loads the BIOS Optimal Default values for all the setup questions.

<F9> key can be used for this operation.

3.6 Beep Sound codes list

3.6.1 Boot Block Beep codes

Number of Beeps	Description
1	Insert diskette in floppy drive A:
2	'AMIBOOT.ROM' file not found in root directory of diskette in A:
4	Flash Programming successful
5	Floppy read error
6	Keyboard controller BAT command failed
7	No Flash EPROM detected
8	Floppy controller failure
9	Boot Block BIOS checksum error
10	Flash Erase error
11	Flash Program error
12	'AMIBOOT.ROM' file size error
13	BIOS ROM image mismatch (file layout does not match image present in flash device)

3.6.2 POST BIOS Beep codes

Number of Beeps	Description
1	Memory refresh timer error.
2	Parity error in base memory (first 64KB block)
4	Motherboard timer not operational
5	Processor error
6	8042 Gate A20 test error (cannot switch to protected mode)
7	General exception error (processor exception interrupt error)
8	Display memory error (system video adapter)
9	AMIBIOS ROM checksum error
10	CMOS shutdown register read/write error
11	Cache memory test failed

3.6.3 Troubleshooting POST BIOS Beep codes

Number of Beeps	Description
1, 2 or 3	Reseat the memory, or replace with known good modules.
4-7, 9-11	<p>Fatal error indicating a serious problem with the system. Consult your system manufacturer. Before declaring the motherboard beyond all hope, eliminate the possibility of interference by a malfunctioning add-in card. Remove all expansion cards except the video adapter.</p> <ul style="list-style-type: none">• If beep codes are generated when all other expansion cards are absent, consult your system manufacturer's technical support.• If beep codes are not generated when all other expansion cards are absent, one of the add-in cards is causing the malfunction. Insert the cards back into the system one at a time until the problem
8	If the system video adapter is an add-in card, replace or reseat the video adapter. If the video adapter is an integrated part of the system board, the board may be faulty.

3.7 AMI BIOS Checkpoints

3.7.1 Bootblock Initialization Code Checkpoints

The Bootblock initialization code sets up the chipset, memory and other components before system memory is available. The following table describes the type of checkpoints that may occur during the bootblock initialization portion of the BIOS *(Note)*:

Checkpoint	Description
Before D0	If boot block debugger is enabled, CPU cache-as-RAM functionality is enabled at this point. Stack will be enabled from this point.
D0	Early Boot Strap Processo (BSP) initialization like microcode update, frequency and other CPU critical initialization. Early chipset initialization is done.
D1	Early super I/O initialization is done including RTC and keyboard controller. Serial port is enabled at this point if needed for debugging. NMI is disabled. Perform keyboard controller BAT test. Save power-on CPUID value in scratch CMOS. Go to flat mode with 4GB limit and GA20 enabled.
D2	Verify the boot block checksum. System will hang here if checksum is bad.
D3	Disable CACHE before memory detection. Execute full memory sizing module. If memory sizing module not executed, start memory refresh and do memory sizing in Boot block code. Do additional chipset initialization. Re-enabled CACHE. Verify that flat mode is enabled.
D4	Test base 512KB memory. Adjust policies and cache first 8MB. Set stack.
D5	Bootblock code is copied from ROM to lower system memory and control is given to it. BIOS now executes out of RAM. Copies compressed boot block code to memory in right segments. Copies BIOS from ROM to RAM for faster access. Performs main BIOS checksum and updates recovery status accordingly.

D6	Both key sequence and OEM specific method is checked to determine if BIOS recovery is forced. If BIOS recovery is necessary, control flows to checkpoint E0. See <i>Bootblock Recovery Code Checkpoints</i> section of document for more information.
D7	Restore CPUID value back into register. The Bootblock- Runtime interface module is moved to system memory and control is given to it. Determine whether in memory.
D8	The Runtime module is uncompressed into memory. CPUID information is stored in memory.
D9	Store the Uncompressed pointer for future use in PMM. Copying Main BIOS into memory. Leaves all RAM below 1MB Read-Write including E000 and F000 shadow areas but closing SMRAM.
DA	Restore CPUID value back into register. Give control to BIOS POS (ExecutePOSTKernel). See <i>POST Code Checkpoints</i> section of document for more information.
DC	System is waking from ACPI S3 state.
E1 - E8 EC - EE	OEM memory detection / configuration error. This range is reserved for chipset vendors & system manufacturers. The error associated with this value may be different from one platform to the next.

3.7.2 Bootblock Recovery Code Checkpoints

The Bootblock recovery code gets control when the BIOS determines that a BIOS recovery needs to occur because the user has forced the update or the BIOS checksum is corrupt. The following table describes the type of checkpoints that may occur during the Bootblock recovery portion of the BIOS *(Note)*:

Checkpoint	Description
E0	Initialize the floppy controller in the super I/O. Some interrupt vectors are initialized. DMA controller is initialized. 8259 interrupt controller is initialized. L2 cache is enabled.
E9	Set up floppy controller and data. Attempt to read from floppy.
EA	Enable ATAPI hardware. Attempt to read from ARMD and ATAPI CDROM.
EB	Disable ATAPI hardware. Jump back to checkpoint E9.
EF	Read error occurred on media. Jump back to checkpoint EB.
F0	Search for pre-defined recovery file name in root directory.
F1	Recovery file not found.
F2	Start reading FAT table and analyze FAT to find the clusters occupied by the recovery file.
F3	Start reading the recovery file cluster by cluster.
F5	Disable L1 cache.
FA	Check the validity of the recovery file configuration to the current configuration of the flash part.
FB	Make flash write enabled through chipset and OEM specific method. Detect proper flash part. Verify that the found flash part size equals the recovery file size.
F4	The recovery file size does not equal the found flash part size.

FC	Erase the flash part.
FD	Program the flash part.
FF	The flash has been updated successfully. Make flash write disabled. Disable ATAPI hardware. Restore CPUID value back into register. Give control to F000 ROM at F000:FFF0h.

3.7.3 POST Code Checkpoints

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS *(Note)*:

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system.
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
07	Fixes CPU POST interface calling pointer.
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
C0	Early CPU Init Start -- Disable Cache - Init Local APIC
C1	Set up boot strap processor Information
C2	Set up boot strap processor for POST
C5	Enumerate and set up application processors
C6	Re-enable cache for boot strap processor

C7	Early CPU Init Exit
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.
13	Early POST initialization of chipset registers.
20	Relocate System Management Interrupt vector for all CPU in the system.
24	Uncompress and initialize any platform specific BIOS modules. GPNV is initialized at this checkpoint.
2A	Initializes different devices through DIM. See DIM Code Checkpoints section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.

38	Initializes different devices through DIM. See DIM Code Checkpoints section of document for more information. USB controllers are initialized at this point.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, ... etc.) successfully installed in the system and update the BDA, EBDA...etc.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory. Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested. Check boot password if installed.
8C	Late POST initialization of chipset registers.
8D	Build ACPI tables (if ACPI is supported)
8E	Program the peripheral parameters. Enable/Disable NMI as selected.
90	Initialization of system management interrupt by invoking all handlers.
A1	Lian-up work needed before booting to OS.

A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module. Display boot option popup menu.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A9	Wait for userinput at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector.
AB	Prepare BBS for Int 19 boot. Init MP tables.
AC	End of POST initialization of chipset registers. De-initializes the ADM module.
B1	Save system context for ACPI. Prepare CPU for OS boot including final MTRR values.
00	Passes control to OS Loader (typically INT19h).

3.7.4 DIM Code Checkpoints

The Device Initialization Manager (DIM) gets control at various times during BIOS POST to initialize different system buses. The following table describes the main checkpoints where the DIM module is accessed *(Note)*:

Checkpoint	Description
2A	Initialize different buses and perform the following functions: Reset, Detect, and Disable (function 0); Static Device Initialization (function 1); Boot Output Device Initialization (function 2). Function 0 disables all device nodes, PCI devices, and PnP ISA cards. It also assigns PCI bus numbers. Function 1 initializes all static devices that include manual configured onboard peripherals, memory and I/O decode windows in PCI-PCI bridges, and noncompliant PCI devices. Static resources are also reserved. Function 2 searches for and initializes any PnP, PCI, or AGP video devices.
38	Initialize different buses and perform the following functions: Boot Input Device Initialization (function 3); IPL Device Initialization (function 4); General Device Initialization (function 5). Function 3 searches for and configures PCI input devices and detects if system has standard keyboard controller. Function 4 searches for and configures all PnP and PCI boot devices. Function 5 configures all onboard peripherals that are set to an automatic configuration and configures all remaining PnP and PCI devices.

While control is in the different functions, additional checkpoints are output to port 80h as a word value to identify the routines under execution. The low byte value indicates the main POST Code Checkpoint. The high byte is divided into two nibbles and contains two fields. The details of the high byte of these checkpoints are as follows:

HIGH BYTE XY

The upper nibble "X" indicates the function number that is being executed. "X" can be from 0 to 7.

- 0 = func#0, disable all devices on the BUS concerned.
- 2 = func#2, output device initialization on the BUS concerned.
- 3 = func#3, input device initialization on the BUS concerned.
- 4 = func#4, IPL device initialization on the BUS concerned.
- 5 = func#5, general device initialization on the BUS concerned.
- 6 = func#6, error reporting for the BUS concerned.
- 7 = func#7, add-on ROM initialization for all BUSES.
- 8 = func#8, BBS ROM initialization for all BUSES.

The lower nibble 'Y' indicates the BUS on which the different routines are being executed. 'Y' can be from 0 to 5.

- 0 = Generic DIM (Device Initialization Manager).
- 1 = On-board System devices.
- 2 = ISA devices.
- 3 = EISA devices.
- 4 = ISA PnP devices.
- 5 = PCI devices.

3.7.5 ACPI Runtime Checkpoints

ACPI checkpoints are displayed when an ACPI capable operating system either enters or leaves a sleep state. The following table describes the type of checkpoints that may occur during ACPI sleep or wake events ^(Note):

Checkpoint	Description
AC	First ASL check point. Indicates the system is running in ACPI mode.
AA	System is running in APIC mode.
01, 02, 03, 04, 05	Entering sleep state S1, S2, S3, S4, or S5.
10, 20, 30, 40, 50	Waking from sleep state S1, S2, S3, S4, or S5.

Note:

Please note that checkpoints may differ between different platforms based on system configuration. Checkpoints may change due to vendor requirements, system chipset or option ROMs from add-in PCI devices.

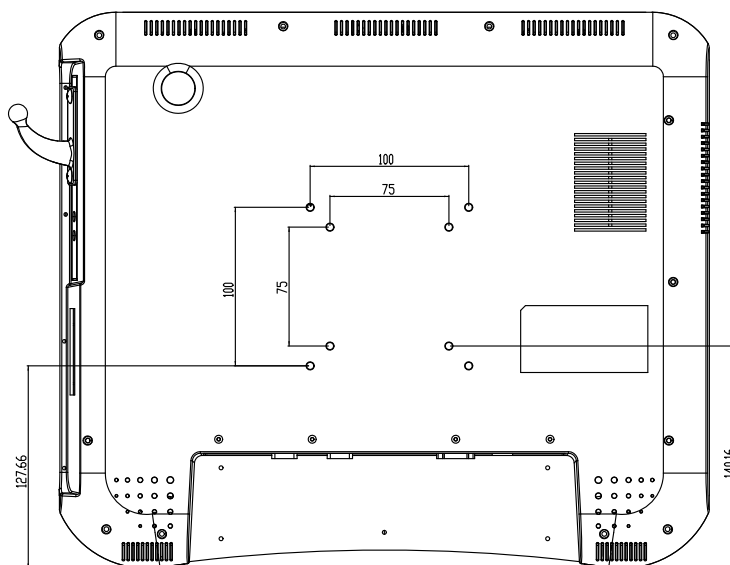


Chapter 4

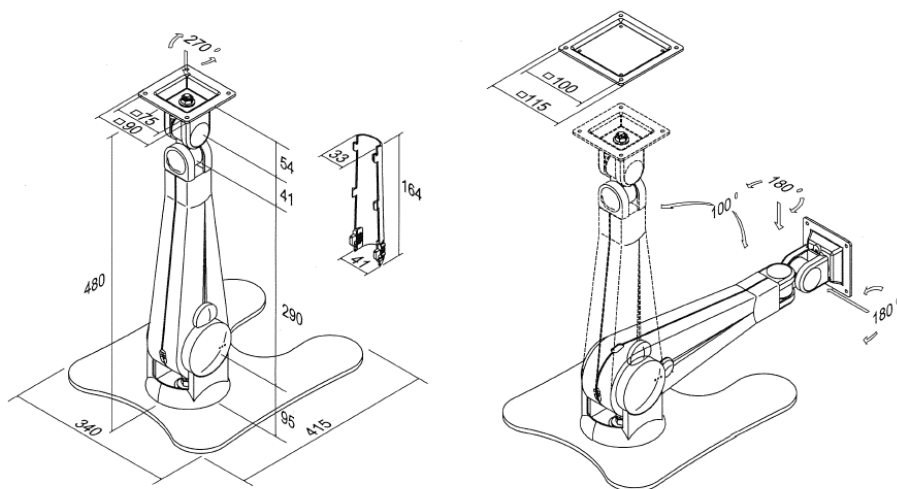
Appendix

4.1 Optional device

The location of holes to install the ARM-150 or equivalent equipment.

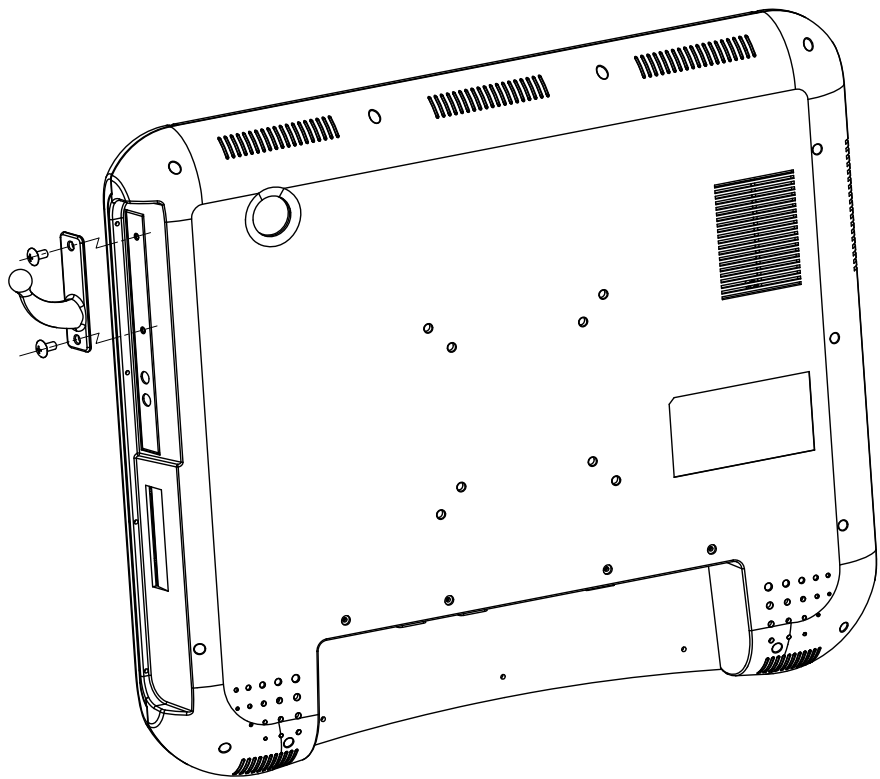


The ARM-150



Unit: mm

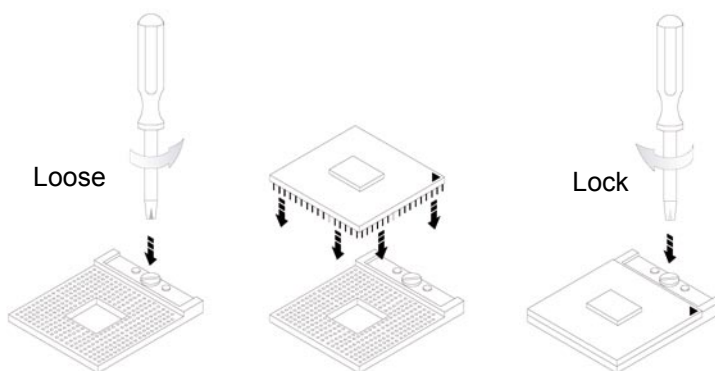
4.2 Installing the Earphone Hook Bracket



4.3 Installing the CPU

The processor socket comes with a screw to secure the CPU. As showing in the picture as below, loose the screw first before inserting the CPU.

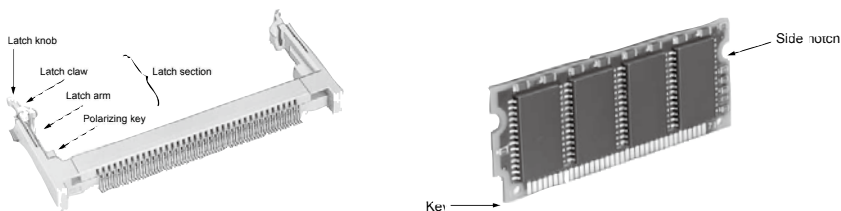
Place the CPU into the socket by making sure the notch on the corner of the CPU corresponding with the notch on the inside of the socket. Once the CPU has slide into the socket, lock the screw.



Make sure that heat sink of the CPU top surface is in complete contact to avoid the CPU overheating problem.

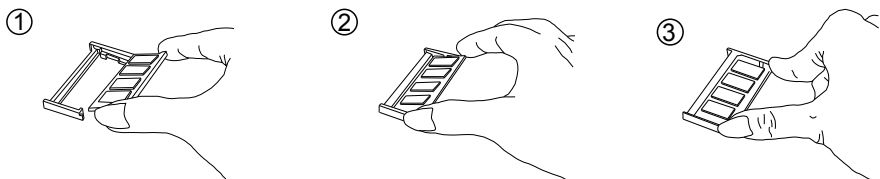
If not, it would cause your system or CPU to be hanged, unstable, damaged.

4.4 Installing the Memory



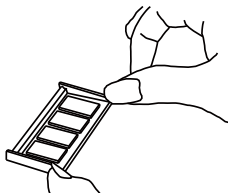
To install the Memory module, locate the Memory SO-DIMM slot on the board and perform as below:

1. Adjust the socket polarizing key and the board key to the same direction.
2. Insert the board obliquely. Moreover, lay the board in parallel to the opening at angle of 20° to 30° , and softly insert the board so as to hit the socket bottom. Stopping insertion halfway will result in improper insertion.
3. Applying the board side notch in parallel to the socket bottom so that the board position cannot be displaced, press the board side notch up, and fix it to the latch portion at both socket edges. Press the board side notch, and release the notch with a snap “click” tone, if the printed board exceeds the latch claw head.



Procedures for board extraction

Apply the thumb nail to the latch knob at both socket edges. Forcibly widen the latch knobs to right and left ways, and release the latch. Then draw the board out along an angle where the board is raised.



4.5 UDOM installation

INTRODUCTION

Scope

This document provides guidelines for installing a Windows XP and Windows 2003 image on a uSolidStateDisk device.

uSolidStateDisk

uSolidStateDisk™ (uSSD™ 5000) merges SanDisk expertise in the USB 2.0 high-speed interface with its decades of flash know-how in embedded systems. The result is the industry's highest performance, combined with uncompromising reliability and built-in security to encrypt data and code. uSolidStateDisk is the ideal storage solution for a vast array of markets such as gaming, industrial PCs, thin clients, POS workstations, servers, and telecom infrastructure equipment.

Windows XP / Windows 2003

Microsoft® Windows XP and Microsoft® Windows 2003 is built on an enhanced Windows 2000 code base, with different versions aimed at home users and business users: Windows XP Home Edition and Windows XP Professional.

System Requirements

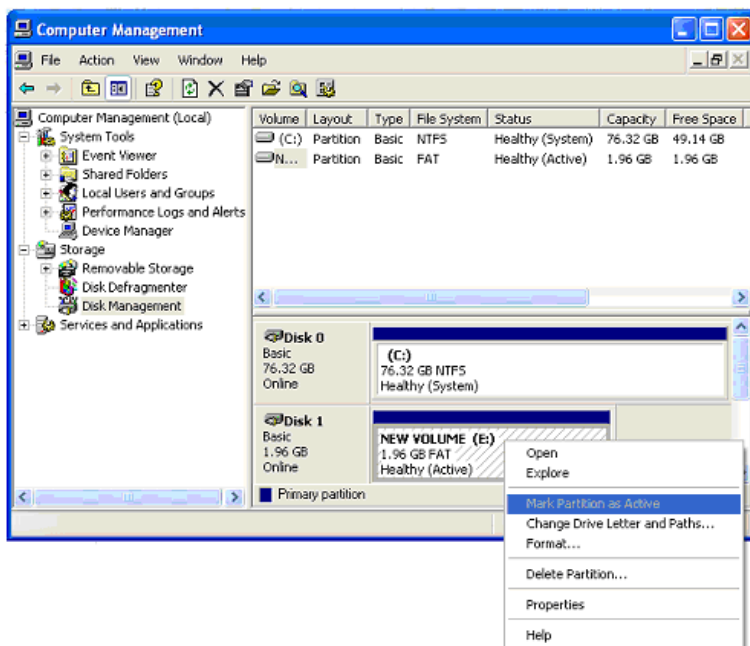
The following hardware and software configuration is required:

- Host computer running Windows OS and containing a CD-ROM drive
- Target computer with no hard drive
- 2GB or higher capacity uSolidStateDisk
- Windows XP SP2 or Windows 2003 installation CD
- SanDisk uSolidStateDisk installation utility for Windows XP
- SanDisk drivers (uDocBoot.sys) and installation package for XP Pro SP2 (uDocInstall, usbport.sy_, NTDETECT.COM)
- SanDisk USB adapter for the uSSD

Preparing uSolidStateDisk

The uSSD 5000 Preparation section requires a working system with XP Pro SP2 installed (host computer). See Appendix A for details on setting up the host computer for the installation procedure.

1. Place the uSolidStateDisk on the companion USB adapter and insert the adapter into a USB slot on the host computer.
2. Delete the MBR (sector 0) from the uSolidStateDisk. You could do this by WinHex or FDISK utility by writing 00 to first sector. Make sure that MBR signature(55AA) overwritten with 0 too.
3. Safely remove the uSolidStateDisk and reconnect it, wait for the host computer to detect the inserted uSolidStateDisk.
4. Using the Windows XP disk management utility, format uSolidStateDisk with a single active partition and the required file system.



Your uSolidStateDisk is now ready to have the Windows XP operating system installed.

Placing the Windows XP Image on uSolidStateDisk

- 1 Place the original Windows XP or Windows 2003 installation CD in the CD-ROM player of the host computer running Windows XP. Exit from autorun.
- 2 Plug the uSolidStateDisk device that you have prepared into the USB port of the host computer.
- 3 Run from command shell `d:\i386\winnt32 /syspart:x: /tempdrive:x: /noreboot /makelocalsource /unattend:unattend.txt`. This will copy windows installation files from CD to uSolidStateDisk.
 - x - is volume letter of uSolidStateDisk
 - d – CD ROM drive letter.
- 4 The file `unattend.txt` is an answer file for unattended installation of Windows XP. (an answer file is a text file that answers the prompts that occur during Setup, which allows Setup to proceed without user intervention):
- 5 Launch the uSolidStateDisk installation utility, using the command: `uDOCWinPEPatch.exe`. The utility adds uSolidStateDisk boot drive support.
- 6 During this run, the utility handles all necessary registry changes to ensure that the USB and uSolidStateDisk drivers load at the beginning of the boot process.
- 7 When the uSolidStateDisk is prepared, remove uSolidStateDisk from the host computer.
- 8 Insert uSolidStateDisk into the dedicated USB port of the target computer, and power on or reboot the target computer.
- 9 The installation process will continue on the target computer.

You now have booted XP/Windows 2003 for the first time from the uSolidStateDisk.

Post Installation

The uSSD 5000 should be ready with a bootable image of XP Pro SP2. The first time boot from the image requires some modifications in order to setup the correct drivers and XP Pro SP2.

Disabling Virtual Memory in Windows XP/Windows 2003

It is necessary to disable the virtual memory functionality (paging files)when

running Windows XP from uSolidStateDisk, because Microsoft do not support it for USB storage boot device.

- 1 Right click in the My Computer window or right click the My Computer icon.
- 2 Select Properties>Advanced tab>Performance Settings>Advanced>Virtual Memory Change.
- 3 Select the No Paging File radio button in the Paging file for selected drive area.
- 4 Click Set.
- 5 Click OK.

Appendix A: Preparing uSolidStateDisk Host PC

A set of binaries needs to be set up before uDOCWinPEPatch.exe can set up the uSSD 5000 properly for the installation. All the binaries should be set up in one folder that resides on the host computer. The following are the contents of the folder:

- NTDETECT – from XP Pro SP2
- uDOCBoot.sy_ (compressed version of uDOCBoot.sys)
- uDOCBoot.in_ (compressed version of uDOCBoot.inf)
- uDOCWinPEPatch.exe
- unattend.txt
- udocset.inf (package contains udocset_msys.inf for legacy msystems uSolidStateDisk and udocset_Sandisk.inf for uSSD 5000. Rename one of them to udocset.inf)

All these files are available in msystems' XP Pro installation package.

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